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Catalyst Poisoning and Catalyst Recovery Due to Misfueling

California State Air Resources Board
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Final Report

CATALYST POISONING AND CATALYST RECOVERY DUE TO MISFUELING

EPA Contract No. 68-03-2783
Work Efforts No. 2 and No. 3

October 31, 1979

Prepared For
United States Environmental Protection Agency
Emission Control Technology Division
Ann Arbor, Michigan 48015

Prepared by

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16. ABSTRACT

Two fleets of catalyst equipped vehicles were tested for exhaust emissions to generate data on the rate of deterioration of catalyst efficiency due to misfueling and on the rate of recovery of catalysts which had been poisoned by one tankful of leaded gasoline. There were ten vehicles in the catalyst poisoning test program, four with oxidation catalysts and [redacted] six with three-way catalysts. A five-car fleet was used for the catalyst recovery test program.

This report presents the data [redacted] generated from the two test programs. Under the contract, analysis of the test data is not required. The test results are therefore not discussed or analyzed in this report.

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SUMMARY

Two fleets of catalyst equipped vehicles were tested for exhaust emissions to generate data on the rate of deterioration of catalyst efficiency due to misfueling and on the rate of recovery of catalyst which had been poisoned by one tankful of leaded gasoline.

There were ten (10) vehicles in the catalyst poisoning test program, four with oxidation catalysts and six with three-way catalysts. Each vehicle was tested for baseline (tail-pipe and engine-out) exhaust emissions with the OEM catalyst first. A new catalyst was then installed and the vehicle was tested again for baseline emissions and every 200 miles thereafter with leaded gasoline, which had a lead content of 2.5 grams per gallon, until the catalyst efficiency dropped to 25% of its initial value. The catalyst efficiency values were calculated from the engine-out and the individual tailpipe exhaust emission figures at each mileage test point. The vehicle finally went through a post-poisoning test series which consisted of engine-out emissions and tailpipe emissions with the OEM catalyst (and a new O_2 sensor for three-way catalyst cars).

In addition to cold start CVS-75 tests, the catalyst poisoning fleet cars also received hot start CVS-72 tests, Federal three-mode tests, Federal two-speed idle tests, and loaded mode tests for exhaust emissions. The exhaust pipe skin temperatures before and after the catalyst were recorded during the Federal three-mode and the Federal two-speed idle tests. Exhaust aldehyde emissions and the composition of exhaust hydrocarbons were determined for each of the hot start CVS-72 tests.

A five-car fleet was used for the catalyst recovery test program. Each vehicle was tested for baseline exhaust emissions with a new catalyst first. After mileage accumulation on one tankful of leaded gasoline, with 2.5 grams of lead per gallon, the vehicle was retested each time when its tank was refilled with unleaded gasoline until the catalyst efficiency recovered to 90% of its initial value. The initial catalyst efficiency was estimated, based on the 10-car catalyst poisoning baseline test data, to be 80%. Only cold start CVS-75 tests with unleaded gasoline were performed on these vehicles.

This report presents the data generated from the two test programs. The data are tabulated in Tables 1 through 66. Under the contract, analysis of the test data is not required. The tests results are therefore not discussed or analyzed in this report.

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CATALYST POISONING AND CATALYST RECOVERY
DUE TO MISFUELING

Environmental Protection Agency
Contract No. 68-03-2783
Work Efforts No. 2 and 3

Final Report

1. Introduction

The California Air Resources Board (ARB), under this contract is to provide the Environmental Protection Agency (EPA) with basic emissions testing support in California. The testing at the ARB is to generate emission data for the individual test programs that are designed by EPA. Each test program is referred to as a "Work Effort" and is assigned a work effort number. Particular requirements for each work effort are specified by EPA in each "scope of work" statement.

Work Effort No. 1 was a presentation in May, 1979 in Ann Arbor, Michigan by an ARB engineer to the Project Officer of this contract and members of EPA staff on the current and proposed ARB motor vehicle emission test projects. The final report on Work Effort No. 1 was submitted on May 31, 1979.

Work Efforts No. 2 and No. 3 were defined and assigned on July 17, 1979, Work Effort No. 2 was to determine the rate of deterioration in catalyst efficiency due to prolong misfueling with leaded gasoline by testing a fleet of ten (10) catalyst equipped vehicles periodically under laboratory controlled conditions. Work Effort No. 3 was to determine the rate of recovery of partially poisoned catalysts that were misfueled with one tankful of leaded gasoline and subsequently filled with unleaded gasoline using a five (5) car fleet. Work Efforts No. 2 and No. 3 started at the ARB laboratory on July 13 and were completed on October 31, 1979.

This report describes the test programs of Work Efforts No. 2 and No. 3 and the test procedures used. This report also presents the test results and summarizes the test data of the two work efforts.

This report is divided into two parts: Part A--Work Effort No. 2, the catalyst poisoning test program, and Part B--Work Effort No. 3 the catalyst recovery test program.

PART A
Catalyst Poisoning Test Program

2. Test Program

2.1 Program Objective

This work effort was designed to determine the rate of deterioration in catalyst efficiency due to prolonged misfueling with leaded gasoline.

2.2 Program Design

Ten late model vehicles with odometer readings under 30,000 miles were procured and tested first under the "as is" condition (screening test) to see whether they were acceptable based on their emission characteristics (high emitter) and mechanical condition (leakage in the exhaust system), for the test program. They were then equipped with new catalysts and baseline tested on unleaded fuel. After completion of baseline tests, the vehicles were tested on leaded fuel at about 200 mile intervals until the catalyst efficiency dropped to 25% of the baseline values.

The baseline catalyst efficiency of the fleet vehicles was based on the CVS-75 screening test results. The subsequent catalyst efficiency of the individual vehicle was calculated from the high cruise mode Federal 3-cycle test data .

Final tests were performed with unleaded gasoline with the original catalyst (tailpipe and "engine out" emissions) to compare with the initial baseline test data. They were tested again after the accumulation of 200 miles to minimize the possible "residue" effect of "lead coating" on the engine parts of the test vehicles before the vehicles were released.

The poisoned catalysts will be sent to EPA for examination/analysis.

2.3 Test Vehicles and Catalysts

The following ten vehicles were procured for Work Effort No. 2.

Date Received	Test Vehicle No.	Description	CID	Odometer	License
7/23/79	1	1979 Chev. Camaro	305	3544	316 XHW
7/17/79	2	1978 Pinto	140	20109	823 UJV
7/16/79	3	1978 Pinto	140	16203	748 UZY
7/20/79	4	1979 Granada	250	10414	406 WDO
7/18/79	5	1979 Futura	302	20041	684 VZF
7/23/79	6	1979 Chev. Camaro	350	3078	291 XJR
7/26/79	7	1979 Chev. Malibu	231	1275	253 XTR
8/2/79	8	1979 Pontiac Sunbird	151	4667	813 WWU
8/6/79	9	1977 Volvo 242 DL	130	26855	605 WKI
8/6/79	10	1977 Volvo 242 DL	130	11982	607 WKI

The following is a description of the catalysts and the associated exhaust emission control (EEC) systems on the ten test vehicles.

Vehicle #	Catalyst Type*	Other EEC Systems**
1	OC-Pellet #6498369	AIR-EGR-EFE
2	TWC-Monolithic #D8EE-5E212-HA	AIR-EGR-OS
3	TWC-Monolithic #D8EE-5E212-HA	EGR-AIR-OS
4	OC-Monolithic #D7BE-5E212-LA	AIR-EGR
5	OC-Monolithic #D9BE-5E212-JA	AIR-EGR
6	OC-Pellet #6498369	AIR-EGR
7	TWC-Pellet #6498369	EGR-EFE-OS
8	TWC-Pellet #8998673	EGR-EFE-OS
9	TWC-Monolithic #1219798	FI-OS
10	TWC-Monolithic #1219798	FI-OS

2.4 Test Fuels

The residue fuel in the underground fuel storage tank at the ARB laboratory was pumped out and the storage tank was cleaned. 3500 gallons of leaded fuel were purchased, put in the tank and filtered. The fuel was analyzed for lead content by the Atomic Absorption Method (Attachment 1). The lead content of the fuel was found to be 2.5 grams per gallon.

Unleaded fuel for the 500 mile catalyst conditioning was obtained from a local ARCO dealer. Indolene clear fuel for all baseline testing was obtained from ARB's existing supply. Records of the fuel consumed for each vehicle are attached (Attachment #2).

2.5 Test Equipment and Instrumentation

2.5.1 Chassis Dynamometer

The Clayton chassis dynamometers model CTE-50 with loading capacity of up to 8500 inertia pounds of Cells No. 3 and 4 were used for Work Efforts No. 2 and 3.

* OC - Oxidation Catalyst
TWC - Three-Way Catalyst

** EFE - Early Fuel Evaporation
AIR - Air Injection Reaction
EGR - Exhaust Gas Recirculation
OS - Oxygen Sensor
FI - Fuel Injection

2.5.2 CVS Sampling and Analyzing Systems

CVS positive displacement pumps (PDP) manufactured by Olson model 45D and by Horiba model 45G were used in Cells No. 3 and 4, respectively. The following analyzers were used with these PDP's to form the CVS sampling trains:

Analyzer	Range	Contaminant	Cell No.
FIAD Beckman 400	0-100 ppm	HC	3
NDIR Beckman 315B	0-1000 ppm	HC	3 & 4
FIAD Horiba FIA-21	0-100 ppm	HC	4
NDIR Beckman 315B	0-3000 ppm	CO/NO	3
NDIR Beckman 315B	0-8%	CO	3 & 4
NDIR Horiba AIA-21A-S	0-3000 ppm	CO	4
NDIR Beckman 315B	0-4%	CO_2	3
NDIR Beckman 315B	0-16%	CO_2	3 & 4
NDIR Horiba AIA-2	0-4%	CO_2	4
CL Beckman 951	0-100 ppm	NOx	3 & 4
NDIR Beckman 315B	0-3000 ppm	NO	4

2.5.3 Precheck Instruments

An Autoscan Analyzer Model #4030R-IR was used in prechecking all test vehicles.

3. Test Procedures

3.1 Vehicle Precheck and Preconditioning

For cold start FTP CVS-75 tests, the normal preconditioning of hot (dummy) CVS-72 plus 12 to 36 cold storage hours was performed.

3.2 FTP CVS-75 Exhaust Emissions Tests

These tests were performed according to Federal Register specified practice (40 CFR 86, Subpart B, Sections 86.101 through 86.177-18).

3.3 Hot CVS-72 Exhaust Emissions Tests

These tests were performed according to Federal Register specified practice for cold start CVS-72 tests (45 CFR 85, Subpart H, Sections 85.70 through 85.95) except that the test vehicle was warmed-up (before the start of the test) by running a dummy CVS-72 driving schedule.

3.4 Federal Three Cycle Tests

These tests were performed per the test procedure supplied by the EPA Project Officer (Attachment #3). The test consisted of three steady state operating modes, high cruise (52 mph), low cruise (25 mph) and idle (in neutral) at specified road load settings.

3.5 Loaded Mode Tests

These tests were performed per ARB's current procedure (Attachment #4).

3.6 Two Idle Speed Tests

These tests were performed with the engine idling (in neutral) at manufacturer's specified speed and at 2500 rpm.

3.7 Test Sequence

A test sequence (TS) consists of the following steps:

1. A CVS-72 preconditioning driving schedule
2. 10 minutes soak
3. Hot CVS-72 exhaust emissions and aldehydes test
4. 10 minutes soak
5. Federal three cycle exhaust emissions test. Exhaust pipe temperatures and exhaust emissions are recorded before and after the catalyst.
6. 5 minutes soak
7. Loaded mode exhaust emissions test. Exhaust pipe temperatures and exhaust emissions are recorded before and after the catalyst.
8. 5 minutes soak
9. Two speed idle emissions test. Exhaust pipe temperatures and exhaust emissions are recorded before and after the catalyst.

3.8 Exhaust Aldehydes Analysis

The MBTH method was used for the determination of exhaust aldehyde concentrations during the hot CVS-72 tests of each TS. The diluted exhaust gas from the CVS sampler was bubbled through three impingers in series at a rate of about 1 CFH. Each of the first and second impingers contained a predetermined amount of 0.05% MBTH solution. The last impinger in the series was left empty to trap any carried over reagent. A laboratory procedure to prepare the MBTH solution and the test set-up is shown in Attachment 5.

After sample collection, the solution in the impingers was oxidized with an oxidizing agent and the intensity of the color developed in the solution was determined by measuring the percent light transmitted

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at a wavelength of 628 nm in a Coleman Model 101 spectrophotometer. The concentration of aldehydes in the solution was read from a calibration curve. The ratio of aldehyde concentration to the total hydrocarbon emission of the exhaust gas sample and the corresponding mass emission of exhaust aldehydes per vehicle mile were then calculated.

3.9 Mileage Accumulation

Driving schedule to accumulate mileage was performed on freeway and city streets near by the Haagen-Smit testing laboratory. A ratio of 45%/55% for Highway/City roads was preserved. A map of the actual routes is attached (Attachment #6).

3.10 GC Analysis

Bag samples collected during the hot CVS-72 tests were forwarded to the Atmospheric Testing Branch for Gas Chromatograph Analysis.

4. Exhaust Emission Tests

4.1 Test Schedule

A combination of cold CVS-75 and test sequence exhaust emission tests were performed on each of the ten test vehicles. The test schedule was as follows:

1. Check and adjust to OEM specifications.
2. Run one CVS-75 screening test with OEM catalyst.
3. If test data are acceptable replace OEM catalyst with new catalyst and precondition the new catalyst with a 500 mile driving schedule consisting of 45%/55% Highway/City driving miles. Then install probes and measure exhaust pipe temperatures and raw exhaust emissions upstream and downstream of catalyst.
4. Run one CVS-75 and one TS to establish baseline tailpipe exhaust emissions.
5. Replace new catalyst with bypass pipe (producing approximately the same backpressure).
6. Run one CVS-75 and one TS to establish baseline engine exhaust emissions.
7. Replace bypass with new catalyst.
8. Start the poisoning procedure by fueling with leaded gasoline and running one CVS-75 and one TS exhaust emissions test at approximately 200 mile intervals until catalyst efficiency (based on high cruise mode Federal 3-cycle test data) has deteriorated to 25% of the baseline value. For vehicles equipped with three-way catalyst (TWC), oxygen sensors are to be checked and serviced/replaced as needed.

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9. Start fueling with unleaded gasoline.

10. Run one reassessment CVS-75 test.

11. Replace oxygen sensor with new one and run one CVS-75 test. If vehicle is not equipped with oxygen sensors, go to step 12.

12. Remove poisoned catalyst.

13. Install bypass and accumulate 200 miles to minimize the effect on emissions of lead residue on engine parts.

14. Run one CVS-75 and one TS test as a final test for baseline engine exhaust emissions.

15. Replace bypass with OEM catalyst, remove temperature probes and restore to original condition.

16. Run one final CVS-75 test to ensure that vehicle meets exhaust emissions standards.

17. Do necessary repair if needed.

18. Release vehicles or repeat steps 16 through 17 if necessary.

4.2 Screening Test

All vehicles procured for test purposes were checked according to manufacturer recommended procedures and adjusted to specifications, if required. For each of the ten vehicles, a cold start FTP CVS-75 screening test (designated 000) was performed to ensure that the test vehicle was in acceptable condition and within emissions standards.

4.3 Engine-Out Exhaust Emissions Test

4.3.1 By-Pass Pipe

To determine engine-out emissions, a straight piece of pipe was used in place of the catalytic converter.

4.3.2 Pressure Differentials of By-Pass Pipes

Each bypass pipe was designed to produce approximately the same pressure differential as the OEM catalyst at 50 mph.
The comparison of pressure differentials, catalyst vs. bypass pipe, of the ten test vehicles is shown in Table 66.

4.4 Exhaust Pipe Skin Temperatures

Exhaust pipe skin temperatures were recorded during the Federal three cycle and the Federal two-speed tests. Two Chromel-Alumel thermocouples are welded to the side of the exhaust pipes and tailpipe (outside) at locations 10" before and 10" after the catalyst. The readings were recorded on a SOLTEC Continuous Recording Multi-Channel Multi-Pen Strip Chart Recorder continuously during the testing.

5. Quality Control

During the testing period, the following instruments and equipment in dynamometer Cells 3 and 4 were checked on a weekly basis:

HC FID Analyzer (6 point calibration check)
NOx Chemiluminescent Analyzer (6 point calibration check)
CO/CO_2 NDIR Analyzer (6 point calibration check)
CVS Verification Test (Propane check)
Dynamometer Coastdown Test (3 point)
NOx Conversion Efficiency (1 point)

All of these instruments and equipment were found to be operating within the tolerance and specifications required for vehicle emission tests. The Quality Control Section's report is attached (Attachment #7).

6. Vehicle Procurement

Vehicles #1, 2, 3 and 4 were rented from Full Service Rental System of West Covina, California.

Vehicle #5 was rented from the Hertz Corporation LAX, Los Angeles, California.

Vehicles #9 and 10 were rented from Systems Control Incorporated of Palo Alto, California.

Vehicle #6 was rented from Budget Rent-A-Car of Covina, California.

Vehicles #7 and 8 were borrowed from GM Van Nuys, California. In return, two vehicles, a 1979 Monte Carlo License #696 WCU and a 1979 Camaro License #022 XHU, were rented from the Hertz Corporation LAX, Los Angeles, California, and were given to GM as compensation for the use of vehicles #7 and 8.

7. Test Results

7.1 Test Number Coding System

The following coding was used to identify the various tests:

000 - Screening test with OEM catalysts -- unleaded fuel.
001 - Initial baseline tests with new catalyst -- unleaded fuel.
002 - Initial baseline tests with bypass -- unleaded fuel.
003 through 020 - Poisoning tests with new catalyst -- leaded fuel.
021 - Final baseline test with poisoned catalyst (and poisoned oxygen sensor if so equipped) -- unleaded fuel.
022 - Final baseline test with poisoned catalyst and new oxygen sensor -- unleaded fuel.
023 - Final baseline test with bypass (and poisoned oxygen sensor if so equipped) -- unleaded fuel.
030 - Final baseline test with OEM catalyst and new oxygen sensor -- unleaded fuel.

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7.2 Test Data

7.2.1 FTP CVS-75 Test Data

Tables 1-10 list the cold start CVS-75 emission and fuel economy data and the calculated catalyst efficiency values. The formula used in calculating the catalyst efficiency is:

$$\% \text{ Reduction} = \frac{\text{Engine Emissions (002 test data) - Tailpipe Emissions (with catalyst)}}{\text{Engine Emissions (002 test data)}}$$

except for the 030 test series. The catalyst efficiency values for this test series were calculated with the same formula but using the 023 test data for emissions.

7.2.2 Hot Start CVS-72 Test Data

Tables 11-20 show the hot start CVS-72 test data including exhaust aldehyde emissions.

7.2.3 Comparison of Hot Start CVS-72 Test Data

The hot start CVS-72 (one bag) data are compared with corresponding two bag data taken from the cold start CVS-75 tests in Tables 21-30.

7.2.4 Federal 3-Cycle Test Data

Tables 31-40 list the 3-cycle test data including the temperature measurements before and after the catalyst, the emissions data, and the calculated catalyst efficiency.

7.2.5 Loaded Mode Test Data

The loaded mode test data, one set of as measured emissions and one set of normalized (carbon balance) emission data are shown in Tables 41-50.

7.2.6 Two Idle Speed Test Data

The two-speed test data, including emissions and temperature measurement before and after the catalyst and the calculated catalyst efficiency values are shown in Tables 51-60.

7.2.7 GC Analysis of Exhaust Hydrocarbons

Gas Chromatograph analysis was not available at the time of writing this report.

PART B
Catalyst Recovery Test Program

8. Test Program

8.1 Program Objectives

This work effort was designed to determine the recovery rate of partially poisoned catalysts that were misfueled with one tankful of leaded gasoline and subsequently filled with unleaded gasoline.

8.2 Program Design

Five late model vehicles with odometer readings between 10,000 and 20,000 miles were used in this test program. They were baseline tested on unleaded fuel and then driven with one full tank of leaded fuel until empty. The vehicles were then tested to determine the initial (poisoning) effects of leaded gasoline on the catalysts. The vehicles were fueled with unleaded gasoline thereafter and tested at every refueling until the catalyst efficiencies had recovered to about 90% of their respective original values. The catalyst efficiency values were calculated from the 75-CVS test results. Restoration work, such as engine adjustments, oxygen sensor replacement, etc., was performed (if required) before the vehicles were released.

8.3 Test Vehicles and Catalysts

The following five vehicles were procured for Work Effort No. 3.

Date Received	Test Vehicle No.	Description	CID	Odometer	License
7/18/79	21	1979 Granada	250	15010	091 WSR
7/18/79	22	1979 Fairmont	302	13637	670 WCH
7/17/79	23	1979 Chev. Caprice	305	18454	782 WOD
7/17/79	24	1979 Cordoba	360	10336	238 XEA
7/27/79	25	1979 Chev. Malibu	231	13940	604 WOF

The following is a description of the catalysts used in this program:

Vehicle #	Catalyst Type	Other EEC Systems
21	OC-Monolithic #D7BE-5E212-LA	AIR-EGR
22	OC-Monolithic #D9BE-5E202-JA	AIR-EGR
23	OC-Pellet #6498369	AIR-EGR-EFE
24	OC-Monolithic #4004714	AIR-EGR-ESA*
25	OC-Pellet #6498369	AIR-EGR-EFE

* Electronic Spark Advance

8.4 Test Fuels

The leaded fuel used in this test program was the same as that used in Work Effort No. 2. The lead content of the fuel was 2.5 grams per gallon.

8.5 Test Equipment and Test Procedures

The same equipment/instrumentation and the same test procedures as described in Section 2.5 and 3 were used for this test program.

8.6 Vehicle Procurement

Vehicles # 21 22, 23, 24 and 25 were rented from the Hertz Corporation LAX, Los Angeles,

9. Exhaust Emissions Tests

Only CVS-75 tests were performed on the five test vehicles. The test schedule was as follows:

1. Check and adjust to OEM specifications.
2. Run three consecutive CVS-75 exhaust emissions tests as initial baseline tests. Omit the third test if the first two are agreeable.
3. Drain tank fuel and fuel with one tankful of leaded gasoline.
4. Accumulate mileage (45%/55% Highway/City) until fuel tank is empty.
5. Fuel with unleaded gasoline and run one CVS-75 at every refueling.
6. Repeat step 5 until catalyst efficiency has recovered to 90% of its initial value.

The initial catalyst efficiency for each vehicle was assumed to be equivalent to the average efficiency of the ten vehicles in the catalyst poisoning program calculated as % HC reduction based on CVS-75 test data as follows:

$$\eta = \frac{\text{Engine Emissions - Tailpipe Emissions (OEM catalyst)}}{\text{Engine Emissions}}$$

The average catalyst efficiency of the ten vehicles was found to be approximately 80% (see Tables 1 through 10).

10. Test Results

10.1 Test Number Coding System

For Work Effort #3 the following test coding was used (all tests with unleaded gasoline):

001 and 002 - Initial baseline tests.
010 - First test after one tankful of leaded gasoline showing maximum poisoning effects.
020 and higher numbers - Recovery tests.

10.2 Test Data

Tables 61-65 list the exhaust emissions test data and the calculated catalyst efficiency values.

11. Attachment

1. Fuel Analysis Report.
2. Summary of Gasoline Consumption
3. Federal Three Cycle Test
4. Loaded Mode Test
5. Aldehydes Determination by the MBTH Method.
6. Routes Used in Mileage Accumulation.
7. Quality Control Report
8. Vehicle History

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Table 1

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Chevrolet (Camaro) - Vehicle No. 1

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
				Initial Baseline With Unleaded Gasoline					
000	3572	0.28	4.08	1.06	12.4	81	70	29	OEM Catalyst
001	4075	0.26	4.10	1.13	12.4	82	69	25	New Catalyst
002	4138	1.45	13.40	1.50	12.5	N.A.	N.A.	N.A.	Engine Emissions
				Tests With Leaded Gasoline					
003	4230	0.82	9.38	1.02	12.6	43	30	32	
004	4467	0.97	9.12	1.01	12.9	33	32	33	
005	4710	1.04	9.12	0.85	12.5	28	32	43	
006	4956	1.00	8.88	0.88	12.4	31	34	41	
007	5195	0.90	10.27	0.87	12.2	38	23	42	
008	5424	1.12	9.26	0.87	12.6	23	31	42	
009	5695	1.55	8.84	1.09	11.5	0	34	27	
010	5904	1.56	8.69	0.91	12.6	0	35	39	
011	6148	1.64	8.14	0.94	12.5	0	39	37	
012	6391	1.78	11.02	0.93	12.5	0	18	38	
				Final Baseline With Unleaded Gasoline					
021	6439	1.30	7.04	1.03	12.5	10	47	31	Poisoned New Catalyst
023	6463	2.64	13.07	0.99	12.8	N.A.	N.A.	N.A.	Engine Emissions
030	6837	0.40	2.97	0.91	12.8	85	77	8	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 2

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1978 Ford (Pinto) - Vehicle No. 2

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
				Initial Baseline With Unleaded Gasoline					
000	20126	0.43	6.07	1.25	18.1	80	85	39	OEM Catalyst
001	20637	0.20	1.95	0.98	18.3	91	95	52	New Catalyst
002	20718	2.17	39.41	2.06	18.7	N.A.	N.A.	N.A.	Engine Emissions
				Tests With Leaded Gasoline					
003	20983	0.73	5.45	0.92	18.9	66	86	55	
004	21197	1.37	6.87	1.14	18.7	37	83	45	
005	21453	1.43	7.16	1.10	19.0	34	82	47	
006	21690	1.94	10.47	1.15	18.3	11	73	44	
				Final Baseline With Unleaded Gasoline					
021	21740	1.60	5.05	1.20	18.1	26	87	42	Poisoned New Catalyst
022	21761	1.46	5.21	1.34	18.0	33	87	35	New O_2 Sensor
023	21989	2.85	39.22	1.91	17.9	N.A.	N.A.	N.A.	Engine Emissions
030	22046	0.68	7.55	1.55	16.8	76	81	19	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 3

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1978 Ford (Pinto) - Vehicle No. 3

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
				Initial Baseline With Unleaded Gasoline					
000	16582	0.51	6.18	1.36	19.0	78	84	38	OEM Catalyst
001	17172	0.34	4.23	0.78	18.7	86	89	64	New Catalyst
002	17251	2.37	39.27	2.18	18.6	N.A.	N.A.	N.A.	Engine Emissions
				Tests With Leaded Gasoline					
003	17502	0.81	6.24	0.78	21.1	66	84	64	
004	17747	1.26	6.57	0.94	20.7	47	83	57	
005	17988	1.41	10.60	1.30	19.8	41	73	40	
006	18242	2.24	14.25	1.36	19.8	5	64	38	
				Final Baseline With Unleaded Gasoline					
021	18284	1.91	10.59	1.31	19.7	19	73	40	Poisoned New Catalyst
022	18305	1.57	7.59	1.61	19.7	34	81	26	New O_2 Sensor
023	18575	3.05	34.22	2.09	18.9	N.A.	N.A.	N.A.	Engine Emissions
030	18929	0.83	6.70	1.35	19.5	73	80	35	OEM Catalyst

This vehicle is selected to undergo ARB recovery tests

Note: Negative efficiencies are reported as zero.

Table 4

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Ford (Granada) - Vehicle No. 4

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
				Initial Baseline With Unleaded Gasoline					
000	10433	0.38	2.40	1.14	15.4	84	91	28	OEM Catalyst
001	10959	0.22	1.46	1.56	16.4	91	95	2	New Catalyst
002	11054	2.36	27.52	1.59	16.0	N.A.	N.A.	N.A.	Engine Emissions
				Tests With Leaded Gasoline					
003	11284	1.69	9.98	1.41	16.7	28	64	11	
004	11519	1.95	13.91	1.27	17.1	17	49	20	
005	11770	2.44	19.55	1.30	16.3	0	29	18	
006	12026	2.16	28.58	1.37	15.7	8	0	14	
				Final Baseline With Unleaded Gasoline					
021	12049	1.34	7.38	1.39	16.2	43	73	13	Poisoned New Catalyst
023	12101	2.58	25.89	1.69	16.3	N.A.	N.A.	N.A.	Engine Emissions
030	12398	0.61	2.06	0.94	15.1	76	92	44	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 5

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Ford (Fairmont Futura) - Vehicle No. 5

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
					Initial Baseline With Unleaded Gasoline				
000	20083	0.44	2.95	1.33	14.8	86	84	3	OEM Catalyst
001	20607	0.23	1.35	1.18	14.8	93	93	14	New Catalyst
002	20715	3.08	18.80	1.37	15.9	N.A.	N.A.	N.A.	Engine Emissions
					Tests With Leaded Gasoline				
003	20934	2.50	9.21	0.91	15.9	19	51	34	
004	21174	2.68	13.73	0.96	15.6	13	27	30	
005	21404	2.64	15.11	1.04	15.8	14	20	24	
					Final Baseline With Unleaded Gasoline				
021	21445	1.80	10.93	1.22	15.3	42	42	11	Poisoned New Catalyst
023	21477	3.55	26.23	1.24	14.7	N.A.	N.A.	N.A.	Engine Emissions
030	21625	1.35	3.44	1.28	14.2	62	87	0	

This vehicle is selected to undergo ARB recovery tests.

Note: Negative efficiencies are reported as zero.

Table 6

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Chevrolet (Camaro Z28) - Vehicle No. 6

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
		Initial Baseline With Unleaded Gasoline							
000	3101	0.33	5.03	1.23	11.7	85	48	0	OEM Catalyst
001	3709	0.21	2.38	1.09	11.9	90	75	0	New Catalyst
002	3807	2.13	9.66	0.97	12.2	NA	NA	NA	Engine Emissions
		Tests With Leaded Gasoline							
003	3887	1.33	9.27	1.14	12.7	38	4	0	
004	4100	1.74	6.36	1.05	12.4	18	34	0	
005	4332	1.44	7.27	1.07	12.8	32	25	0	
006	4558	1.42	5.71	1.12	13.0	33	41	0	
007	4778	1.52	5.87	1.05	13.0	29	39	0	
008	5057	1.77	2.66	1.07	13.2	17	72	0	
009	5277	1.99	7.83	1.28	11.7	7	19	0	
010	5502	2.13	4.15	1.19	12.5	0	57	0	
		Final Baseline With Unleaded Gasoline							
021	5561	1.45	6.17	1.21	12.6	32	36	0	Poisoned New Catalyst
023	5607	2.53	10.85	0.96	12.5	NA	NA	NA	Engine Emissions
030	5809	0.40	3.91	1.07	12.8	84	64	0	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 7

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Chevrolet (Malibu Classic) - Vehicle No. 7

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
Initial Baseline With Unleaded Gasoline									
000	1330	0.37	3.84	0.78	17.2	80	69	71	OEM Catalyst
001	1369	0.40	4.04	0.77	16.9	79	68	71	New Catalyst
002	1398	1.87	12.57	2.70	18.5	NA	NA	NA	Engine Emissions
Tests With Leaded Gasoline									
003	1650	1.17	14.71	0.65	17.9	37	0	76	
004	1901	1.39	16.68	1.06	18.0	26	0	61	
005	2115	1.58	17.01	0.87	17.7	16	0	68	
006	2359	1.94	21.84	1.52	16.2	0	0	44	
Final Baseline With Unleaded Gasoline									
021	2391	2.53	26.80	1.38	17.2	0	0	49	Poisoned New Catalyst
022	2413	1.37	7.49	1.86	16.3	27	40	31	New O_2 Sensor
023	2665	2.61	14.28	2.55	18.0	NA	NA	NA	Engine Emissions
030	2684	0.43	6.18	0.34	17.9	84	57	87	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 8

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1979 Pontiac (Sunbird) - Vehicle No. 8

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
Initial Baseline With Unleaded Gasoline									
000	4777	0.21	4.23	0.42	19.4	86	71	76	OEM Catalyst
001	4812	0.20	2.90	0.52	18.8	87	80	71	OEM Catalyst
002	4844	1.55	14.81	1.77	19.4	NA	NA	NA	Engine Emissions (original O_2 sensor which was subject to intermittent failure was used on all baselines)
Tests With Leaded Gasoline									
003	5116	0.74	8.41	0.48	19.8	52	43	73	New O_2 sensor installed
004	5584	0.94	8.53	0.50	19.5	39	42	72	
005	5861	0.99	9.09	0.59	18.6	36	39	67	
006	6078	1.21	9.82	0.55	19.5	22	34	69	
Final Baseline With Unleaded Gasoline									
021	6150	1.34	12.23	0.57	19.0	14	17	45	Poisoned New Catalyst
022	6171	0.83	3.62	0.97	19.0	46	76	45	New O_2 Sensor
023	6416	2.08	15.47	1.82	19.6	NA	NA	NA	Engine Emissions
030	6595	0.40	6.10	0.58	19.7	81	61	68	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 9

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1977 Volvo (Model 242 DL) - Vehicle No. 9

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
Initial Baseline With Unleaded Gasoline									
000	26864	0.21	3.97	0.15	17.9	83	75	93	OEM Catalyst
001	27390	0.24	3.69	0.15	17.5	81	77	93	New Catalyst
002	27428	1.24	16.05	2.28	18.4	NA	NA	NA	Engine Emissions
Tests With Leaded Gasoline									
003	27665	1.22	18.57	0.41	18.4	2	0	82	
004	27900	1.48	14.40	1.36	16.2	0	10	40	
005	28164	1.28	13.32	1.21	18.5	0	17	47	
006	28411	1.41	10.42	1.11	18.9	0	35	51	
007	28666	1.70	10.15	1.67	17.6	0	37	27	
008	28879	1.59	8.17	1.34	18.9	0	49	41	
009	29138	1.46	3.50	1.52	19.0	0	78	33	
010	29306	1.39	5.04	1.37	19.8	0	69	40	
Final Baseline with Unleaded Gasoline									
021	29583	1.34	5.91	1.57	18.6	0	57	31	Poisoned new catalyst
023	29698	1.51	20.46	2.06	18.6	NA	NA	NA	Engine Emissions
030	30451	0.72	12.13	0.09	18.2	52	41	96	OEM Catalyst with new O_2 sensor.

Note: Negative efficiencies are reported as zero.

Table 10

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-75 EXHAUST EMISSIONS AND EFFICIENCY TEST DATA

1977 Volvo (Model 242 DL) - Vehicle No. 10

		COLD CVS - 75				Catalyst Efficiency (% Reduction)			
		Exhaust Emissions (g/m)			Fuel Economy				
Test No.	Odom.	HC	CO	NOx	MPG	HC	CO	NOx	Remarks
					Initial Baseline With Unleaded Gasoline				
000	11992	0.33	3.29	0.34	17.9	73	77	88	OEM Catalyst
001	12510	0.18	2.60	0.07	18.7	85	82	97	New Catalyst
002	12563	1.20	14.29	2.73	18.2	NA	NA	NA	Engine Emissions
					Tests With Leaded Gasoline				
003	12808	1.27	13.05	0.27	18.4	0	10	90	
004	13046	1.35	9.89	0.59	17.9	0	31	78	
					Final Baseline With Unleaded Gasoline				
021	13095	1.38	11.19	1.10	17.9	0	22	60	Poisoned New Catalyst
022	13114	0.81	2.35	2.36	18.1	33	84	14	New O_2 Sensor
023	13397	1.41	15.64	2.65	17.9	NA	NA	NA	Engine Emissions
030	13443	0.51	6.75	0.12	18.7	64	57	95	OEM Catalyst

Note: Negative efficiencies are reported as zero.

Table 11

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Chevrolet (Camaro) - Vehicle No. 1

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes HC (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	4115	0.09	0.92	1.10	13.3	10.8*	New Catalyst
002	4204	1.45	11.38	1.04	13.7	2.5	Engine Emissions
		Tests With Leaded Gasoline					
003	4241	0.59	4.64	0.86	13.5	3.4	
004	4478	0.79	5.30	0.93	13.9	4.8	
005	4721	0.86	4.12	0.75	13.3	3.2	
006	4967	0.67	3.78	0.78	13.3	4.1	
007	5206	1.33	6.45	0.80	13.3		
008	5435	0.86	4.72	0.81	13.2	3.4	
009	5668	1.28	3.61	0.81	13.3	2.5	
010	5915	1.17	3.54	1.07	12.6	4.6	
011	6119	1.16	2.84	0.82	13.9	4.2	
012	6367	1.36	5.51	0.87	13.5	-	
		Final Baseline With Unleaded Gasoline					
023	6474	2.33	8.95	0.91	14.0	3.2	Engine Emissions

*HC emissions are small (<0.1 g/m)

Table 12

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1978 Ford (Pinto) - Vehicle No. 2

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes/HC (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	20666	0.13	0.26	0.86	19.5	4.1	New Catalyst
002	20694	1.66	28.42	1.94	19.9	1.4	Engine Emissions
		Tests With Leaded Gasoline					
003	20952	0.74	0.98	0.87	20.3	5.0	
004	21215	1.14	2.48	1.10	20.7	2.1	
005	21464	1.61	10.20	1.19	20.6	1.0	
006	21709	1.78	13.84	1.22	19.8	0.7	
		Final Baseline With Unleaded Gasoline					
023	22010	2.25	21.21	1.81	21.0	-	Engine Emissions

Table 13

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1978 Ford (Pinto) - Vehicle No. 3

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy	Aldehydes (%)	
Test No.	Odom.	HC	CO	NOx	MPG	HC	Remarks
		Initial Baseline With Unleaded Gasoline					
001	17191	0.13	0.52	0.73	20.7	2.1	New Catalyst
002	17220	1.89	28.07	1.97	20.5	2.5	Engine Emissions
		Tests With Leaded Gasoline					
003	17478	0.50	1.24	0.98	22.8	4.3	
004	17758	1.11	2.59	0.89	22.9	1.3	
005	17999	1.14	5.27	1.34	22.1	1.2	
006	18253	1.97	12.17	1.33	20.9	-	
		Final Baseline With Unleaded Gasoline					
023	18586	2.37	22.90	1.98	20.9	1.5	Engine Emissions

Table 14

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Ford (Granada) - Vehicle No. 4

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes HC (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	10991	0.15	0.13	1.35	17.3	4.5	New Catalyst
002	11024	2.35	27.49	1.45	15.7	1.7	Engine Emissions
		Tests With Leaded Gasoline					
003	11296	1.48	6.66	1.20	18.0	1.5	
004	11534	2.00	13.29	1.20	17.1	1.9	
005	11781	1.77	10.60	1.16	17.6	1.3	
006	11996	2.02	9.83	1.09	17.5	1.1	
		Final Baseline With Unleaded Gasoline					
023	12071	2.33	17.55	1.62	17.7	1.7	Engine Emissions

Table 15

WORK EFFORT NO. 2 - CATALYST POISONING TESTS HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Ford (Fairmont Futura) - Vehicle No. 5

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy	Aldehydes (%)	
Test No.	Odom.	HC	CO	NOx	MPG	HC	Remarks
		Initial Baseline With Unleaded Gasoline					
001	20637	0.19	0.13	1.11	17.0	1.3	New Catalyst
002	20670	2.86	14.33	1.15	16.7	2.3	Engine Emissions
		Tests With Leaded Gasoline					
003	20945	2.24	7.12	0.90	17.5	1.8	
004	21185	2.31	9.64	0.98	16.7	1.2	
005	21414	2.97	13.27	0.96	16.1	1.0	
		Final Baseline With Unleaded Gasoline					
023	21488	3.64	19.44	1.27	15.5	1.4	Engine Emissions

Table 16

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Chevrolet (Camaro Z28) - Vehicle No. 6

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes HC (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	3737	0.09	0.13	1.58	12.1	11.4*	New Catalyst
002	3778	2.13	7.26	0.75	13.0	2.4	Engine Emissions
		Tests With Leaded Gasoline					
003	3848	1.27	1.11	0.87	13.5	4.8	
004	4111	1.50	1.51	0.92	14.0	-	
005	4343	1.48	1.69	1.03	13.7	2.4	
006	4569	1.28	1.42	1.02	14.0	2.6	
007	4799	1.48	2.07	0.98	14.1	-	
008	5035	1.48	1.61	0.98	14.1	-	
009	5208	1.63	2.72	1.35	12.6	3.7	
010	5513	1.95	2.02	1.04	13.8	2.8	
		Final Baseline With Unleaded Gasoline					
023	5581	2.41	9.26	0.98	13.3	2.5	Engine Emissions

*HC emissions are small (<0.1 g/m)

Table 17

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Chevrolet (Malibu Classic) - Vehicle No. 7

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes HC (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	1349	0.05	0.32	0.53	17.9	73.9*	New Catalyst
002	1409	1.63	9.66	2.61	19.0	1.9	Engine Emissions
		Tests With Leaded Gasoline					
003	1661	0.75	12.38	0.32	18.6	-	
004	1880	0.89	11.50	0.56	19.9	1.2	
005	2126	1.28	14.15	0.75	18.8	0.9	
006	2370	1.79	17.67	1.22	17.0	-	
		Final Baseline With Unleaded Gasoline					
023	2641	2.10	11.41	2.25	18.8	1.7	Engine Emissions

*HC emissions are small (<0.1 g/mi).

Table 18

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
HOT FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1979 Pontiac (Sunbird) - Vehicle No. 8

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	Aldehydes/HC (%)	Remarks
Initial Baseline With Unleaded Gasoline							
001	4795	0.06	2.15	0.49	20.4	55.4*	New Catalyst
002	4856	1.46	13.16	1.81	20.8	2.2	Engine Emissions
Tests With Leaded Gasoline							
003	5127	0.51	5.92	0.49	20.9	2.5	
004	5352	0.46	6.79	0.55	21.5	2.8	
005	5594	0.56	4.55	0.50	20.8	2.7	
006	5836	0.76	4.99	0.60	20.6		
007	6089	0.97	6.76	0.54	20.8	2.3	
Final Baseline With Unleaded Gasoline							
023	6396	1.99	14.55	1.82	20.2	1.2	Engine Emissions

*HC emissions are small (<0.1 g/m).

Table 19

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1977 Volvo (Model 242-DL) - Vehicle No. 9

Test No.	Odom.	HOT CVS - 72 Exhaust Emissions (g/m) HC	 CO	 NOx	 Fuel Economy MPG	Aldehydes (%) HC	Remarks
		Initial Baseline With Unleaded Gasoline					
001	27401	0.07	1.17	0.05	19.4	26.8*	New Catalyst
002	27438	0.99	12.37	2.00	19.8	2.0	Engine Emissions
		Tests With Leaded Gasoline					
003	27676	1.04	15.87	0.35	19.3	1.0	
004	27921	1.06	10.09	0.81	18.9	0.9	
005	28142	1.06	10.19	0.91	19.3	-	
006	28389	1.17	6.00	1.13	19.9	1.6	
007	28641	1.21	5.40	1.09	19.9	1.7	
008	28890	1.33	5.01	1.12	20.1 1.9	1.8	
009	29116	1.22	1.49	1.44	20.2	-	
010	29317	1.18	1.97	1.25	21.0	2.2	

*HC emissions are small (<0.1 g/m).

Table 20

WORK EFFORT NO. 2 - CATALYST POISONING TESTS
FTP CVS-72 EXHAUST EMISSIONS AND ALDEHYDES TEST DATA

1977 Volvo (Model 242 DL) - Vehicle No. 10

		HOT CVS - 72					
		Exhaust Emissions (g/m)			Fuel Economy		
Test No.	Odom.	HC	CO	NOx	MPG	$\frac{\text{Aldehydes}}{\text{HC}}$ (%)	Remarks
		Initial Baseline With Unleaded Gasoline					
001	12521	0.06	0.52	0.04	19.4	41.1*	New Catalyst
002	12582	1.12	13.07	2.45	19.9	1.8	Engine Emissions
		Tests With Leaded Gasoline					
003	12825	1.07	12.47	0.31	19.9	0.9	
004	13064	1.14	8.97	0.63	19.7	0.9	
		Final Baseline With Unleaded Gasoline					
023	13416	1.21	14.14	2.48	19.6	2.1	Engine Emissions

*HC emissions are small (<0.1 g/m).

Table 21

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 CHEVROLET (CAMARO) - Vehicle No. 1

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
			Initial Baseline With Unleaded Gasoline							
001	4115	0.09	0.92	664	1.10	0.11	0.52	684	1.08	New Catalyst
002	4204	1.45	11.38	627	1.04	1.31	9.83	668	1.48	Engine Emissions
			Tests With Leaded Gasoline							
003**	4241	0.59	4.64	647	0.86	0.65	7.41	690	1.00	
004	4478	0.79	5.30	627	0.93	0.80	4.87	655	0.98	
005	4721	0.86	4.12	657	0.75	0.84	3.71	676	0.80	
006	4967	0.67	3.78	661	0.78	0.81	3.23	683	0.81	
007	5206	1.33	6.45	652	0.80	0.73	5.50	691	0.82	
008	5435	0.86	4.72	663	0.81	0.95	4.81	670	0.81	
009	5668	1.28	3.61	658	0.81	1.23	4.00	673	1.04	
010	5915	1.17	3.54	696	1.07	1.26	3.01	667	0.85	
011	6119	1.16	2.84	630	0.82	1.34	3.29	672	0.89	
012	6367	1.36	5.51	643	0.87	1.50	6.28	675	0.89	
			Final Baseline With Unleaded Gasoline							
023	6474	2.33	8.95	611	0.91	2.52	9.41	644	0.91	

* Split bag calculated from cold start CVS-75 testing.

** First test with leaded gasoline - no mileage accumulation

Table 22

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1978 FORD (Pinto) - Vehicle No. 2

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
				Initial Baseline With Unleaded Gasoline						
001	20666	0.13	0.26	454	0.86	0.15	0.22	460	0.88	New Catalyst
002	20694	1.66	28.42	396	1.94	1.82	27.60	401	1.98	Engine Emissions
				Tests With Leaded Gasoline						
003	20952	0.74	0.98	432	0.87	0.56	0.09	440	0.90	
004	21215	1.14	2.48	421	1.10	1.12	0.92	441	1.15	
005	21464	1.61	10.20	410	1.19	1.29	2.67	430	1.15	
006	21709	1.78	13.84	420	1.22	1.73	4.75	442	1.23	
				Final Baseline With Unleaded Gasoline						
023	22010	2.25	21.21	383	1.81	2.46	25.69	415	1.97	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 23

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1978 FORD (Pinto) - Vehicle No. 3

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
Initial Baseline With Unleaded Gasoline										
001	17191	0.13	0.52	427	0.73	0.15	0.47	449	0.73	New Catalyst
002	17220	1.89	28.07	383	1.97	2.03	32.02	397	2.20	Engine Emissions
Tests With Leaded Gasoline										
003	17478	0.50	1.24	385	0.98	0.53	0.80	394	0.76	
004	17758	1.11	2.59	380	0.89	0.99	1.71	399	0.95	
005	17999	1.14	5.27	389	1.34	1.19	2.30	399	1.32	
006	18253	1.97	12.17	399	1.33	1.84	7.47	404	1.40	
Final Baseline With Unleaded Gasoline										
023	18586	2.37	22.90	381	1.98	2.48	25.78	395	2.07	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 24

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 FORD (GRANADA) - Vehicle No. 4

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
Initial Baseline With Unleaded Gasoline										
001	10991	0.15	0.13	513	1.35	0.13	0.21	504	1.31	New Catalyst
002	11024	2.35	27.49	515	1.45	2.23	23.81	488	1.42	Engine Emissions
Tests With Leaded Gasoline										
003	11296	1.48	6.66	478	1.20	1.56	7.16	494	1.19	
004	11534	2.00	13.29	493	1.20	1.82	10.46	473	1.09	
005	11781	1.77	10.60	483	1.16	2.02	14.52	490	1.12	
006	11996	2.02	9.83	486	1.09	2.10	23.65	507	1.28	
Final Baseline With Unleaded Gasoline										
023	12071	2.33	17.55	466	1.62	1.18	14.69	477	1.57	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 25

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 FORD (Futura) - Vehicle No. 5

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
			Initial Baseline With Unleaded Gasoline							
001	20637	0.19	0.13	522	1.11	0.20	0.39	551	1.06	New Catalyst
002	20670	2.86	14.33	500	1.15	2.91	14.05	492	1.28	Engine Emissions
			Tests With Leaded Gasoline							
003	20945	2.24	7.12	490	0.90	2.43	6.60	506	0.87	
004	21185	2.31	9.64	508	0.98	2.49	9.37	511	0.94	
005	21414	2.97	13.27	520	0.96	2.67	11.17	527	1.04	
			Final Baseline With Unleaded Gasoline							
023	21488	3.64	19.44	530	1.27	3.37	21.59	545	1.21	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 26

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 CHEVROLET (CAMARO Z28) - Vehicle No. 6

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
				Initial Baseline With Unleaded Gasoline						
001	3737	0.09	0.13	734	1.58	0.13	0.23	715	1.03	New Catalyst
002	3778	2.13	7.26	666	0.75	2.11	5.91	682	0.93	Engine Emissions
				Tests With Leaded Gasoline						
003	3848	1.27	1.11	652	0.87	0.90	1.48	652	1.11	
004	4111	1.50	1.51	627	0.92	1.52	1.39	677	1.01	
005	4343	1.48	1.69	640	1.03	1.33	1.76	658	1.04	
006	4569	1.28	1.42	628	1.02	1.23	1.44	645	1.08	
007	4799	1.48	2.07	621	0.98	1.36	2.25	640	1.00	
008	5035	1.48	1.61	623	0.98	1.61	2.03	647	1.01	
009	5288	1.63	2.72	697	1.35	1.74	3.43	726	1.31	
010	5513	1.95	2.02	634	1.04	2.02	2.22	677	1.14	
				Final Baseline With Unleaded Gasoline						
023	5581	2.41	9.26	646	0.98	1.26	1.22	668	1.16	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 27

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 CHEVROLET (Malibu) - Vehicle No. 7

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
Initial Baseline With Unleaded Gasoline										
001	1349	0.05	0.32	495	0.53	0.06	0.38	506	0.52	New Catalyst
002	1409	1.63	9.66	447	2.61	1.61	9.19	443	2.54	Engine Emissions
Tests With Leaded Gasoline										
003	1661	0.75	12.38	454	0.32	0.73	10.44	459	0.33	
004	1880	0.89	11.50	425	0.56	1.06	12.82	455	0.76	
005	2126	1.28	14.15	446	0.75	1.22	12.42	457	0.65	
006	2370	1.79	17.67	448	1.22	1.70	17.37	496	1.22	
Final Baseline With Unleaded Gasoline										
023	2641	2.10	11.41	447	2.25	2.11	10.44	450	2.38	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 28

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1979 PONTIAC (Sunbird) - Vehicle No. 8

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
				Initial Baseline With Unleaded Gasoline						
001	4795	0.06	2.15	431	0.49	0.08	2.56	437	0.40	New Catalyst
002	4856	1.46	13.16	401	1.81	1.49	13.02	414	1.83	Engine Emissions
				Tests With Leaded Gasoline						
003	-	-	-	-	-	-	-	-	-	
004	5127	0.51	5.92	414	0.49	0.53	6.09	425	0.49	
005	5352	0.46	6.79	401	0.55	-	-	-	-	
006	5594	0.56	4.55	418	0.50	0.74	5.89	428	0.47	
007	5836	0.76	4.99	420	0.60	0.83	6.29	449	0.60	
008	6089	0.97	6.76	414	0.54	0.97	6.11	421	0.52	
				Final Baseline With Unleaded Gasoline						
023	6396	1.99	14.55	410	1.82	2.01	13.23	411	1.91	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Table 29

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1977 VOLVO (Model 242-DL) - Vehicle No. 9

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
				Initial Baseline With Unleaded Gasoline						
001	27401	0.07	1.17	456	0.05	0.09	1.25	488	0.01	New Catalyst
002	27438	0.99	12.37	427	2.00	1.09	13.89	444	2.16	Engine Emissions
				Tests With Leaded Gasoline						
003	27676	1.04	15.87	433	0.35	1.08	16.48	438	0.35	
004	27921	1.06	10.09	450	0.81	1.24	11.56	509	1.25	
005	28142	1.06	10.19	441	0.91	1.14	11.91	443	1.08	
006	28389	1.17	6.00	432	1.13	1.24	8.32	439	1.00	
007	28641	1.21	5.40	433	1.09	1.46	7.76	468	1.48	
008	28890	1.33	5.01	429	1.12	1.40	6.21	437	1.22	
009	29116	1.22	1.49	433	1.44	1.33	1.27	448	1.46	
010	29317	1.18	1.97	415	1.25	1.23	2.03	425	0.56	

* Split bag calculated from cold start CVS-75 testing.

Table 30

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

COMPARISON OF HOT CVS-72 TEST DATA *

ONE BAG MEASURED VERSUS SPLIT BAG CALCULATED

1977 VOLVO (Model 242-DL) - Vehicle No. 10

		One Bag Measured (g/m)				Split Bag Calculated (g/m)				
Test No.	Odom.	HC	CO	CO_2	NOx	HC	CO	CO_2	NOx	Remarks
				Initial Baseline With Unleaded Gasoline						
001	12521	0.06	0.52	455	0.04	0.06	0.62	456	0.05	New Catalyst
002	12582	1.12	13.07	422	2.45	1.07	12.36	447	2.59	Engine Emissions
				Tests With Leaded Gasoline						
003	12825	1.07	12.47	424	0.31	1.12	11.00	444	0.22	
004	13064	1.14	8.97	432	0.63	1.19	7.63	479	0.51	
				Final Baseline With Unleaded Gasoline						
023	13416	1.21	14.14	427	2.48	1.24	13.14	449	2.57	Engine Emissions

* Split bag calculated from cold start CVS-75 testing.

Tables 31 - 40

Federal Three Cycle Test Data

Tables 31-40 present the exhaust pipe skin temperatures before and after the catalyst and the catalyst efficiency values which are calculated from the normalized emission values. Tables 31A-40A show the "as measured" raw emission data. The abbreviations used in these tables for the three cycles are:

HC for high (speed) cruise
LC for low (speed) cruise
ID for idle "in drive"
IN for idle "in neutral"

Table 31

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET CAMARO - VEHICLE NO. 1

Test		CATALYST TEMPERATURE (^{o}F) Before	 After	CATALYST EFFICIENCY (% REDUCTION) HC	 CO	 NOx
001						
	HC	630	530	50.7	67.1	6.0
	LC	620	570	52.2	66.4	0
	ID	590	540	79.7	66.1	17.3
	IN	480	500	82.6	66.7	0.2
002						
	HC	640	490	10.6	0	0
	LC	700	550	0	0.05	0
	ID	590	510	0	0.1	0.1
	IN	530	463	0	0	0
003						
	HC	750	580	41.5	34.5	0
	LC	750	640	44.9	32.9	0
	ID	570	580	54.4	50.4	20.7
	IN	515	552	44.7	66.8	33.6
004						
	HC	635	500	37.8	40.5	0
	LC	660	560	36.4	38.1	6.6
	ID	510	510	34.6	50.2	20.5
	IN	469	492	28.7	49.1	0
005						
	HC	745	570	38.3	39.2	0
	LC	800	660	44.6	26.1	0
	ID	620	600	52.9	33.6	0
	IN	535	585	53.4	49.7	0

Table 31 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET CAMARO - VEHICLE NO. 1

Test		CATALYST TEMPERATURE (^{o}F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
006						
	HC	832	635	52.0	26.0	0
	LC	840	706	49.5	49.5	0
	ID	635	622	61.7	33.6	0.3
	IN	548	595	47.0	48.9	0
007						
	HC	780	600	47.3	25.9	0
	LC	810	690	46.0	26.0	0
	ID	600	620	54.8	32.0	0
	IN	520	590	38.5	50.1	0.3
008						
	HC	755	580	36.2	50.6	0
	LC	805	670	50.5	67.0	0
	ID	630	610	58.1	50.1	0
	IN	540	585	42.9	50.5	0.9
009						
	HC	898	788	51.0	32.9	0
	LC	839	736	51.0	66.3	0
	ID	582	622	55.8	50.1	0.3
	IN	520	587	31.8	66.8	0.5
010						
	HC	800	620	39.8	40.5	0
	LC	825	715	38.4	50.5	0
	ID	585	615	53.5	50.1	0
	IN	515	575	25.8	66.1	0

HC = High Cruise, LC = Low Cruise, ID = Idle in drive and IN = Idle in neutral

Table 31 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET CAMARO - VEHICLE NO. 1

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
011						
	HC	770	570	26.3	26.0	0
	LC	785	655	46.0	34.2	0
	ID	625	600	52.6	66.6	0
	IN	535	570	32.6	66.1	0
012						
	HC	897	832	32.6	49.4	0
	LC	774	782	45.9	34.1	0
	ID	628	685	54.5	66.6	0
	IN	552	630	19.5	66.9	0
023						
	HC	810	585	29.4	50.4	0
	LC	785	665	38.7	32.9	0
	ID	570	585	41.1	49.1	0
	IN	505	550	37.3	49.3	0

Table 32

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1978 FORD PINTO - VEHICLE NO. 2

Test		CATALYST TEMPERATURE (^{o}F) Before	After	CATALYST EFFICIENCY (% REDUCTION) HC	CO	NOx
001	HC	760	560	70.3	92.9	36.6
	LC	700	610	79.7	88.2	64.3
	ID	570	530	74.3	97.5	0
	IN	510	554	69.7	96.2	0
002	HC	760	650	0	10.4	0
	LC	690	580	3.7	0	0.4
	ID	530	640	1.9	5.4	0
	IN	461	376	3.9	4.5	0
003	HC	840	650	72.8	91.7	9.8
	LC	720	620	72.7	90.0	59.7
	ID	560	540	68.1	94.9	0
	IN	-	-	60.0	96.2	0
004	HC	777	560	47.9	88.8	0
	LC	710	590	34.0	90.6	27.2
	ID	560	530	44.1	79.0	16.1
	IN	500	550	37.8	89.3	6.5
005	HC	819	615	48.2	93.8	0
	LC	678	578	21.6	91.2	13.8
	ID	514	503	13.3	14.5	15.7
	IN	451	488	6.2	62.2	5.0

Table 32 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1978 FORD PINTO - VEHICLE NO. 2

Test	CATALYST TEMPERATURE (^oF) Before	 After	CATALYST EFFICIENCY (% REDUCTION) HC	 CO	 NOx
006					
HC	810	615	47.7	87.3	0
LC	690	595	20.0	82.4	14.2
ID	510	505	11.5	32.0	15.7
IN	450	470	3.4	36.1	0
023					
HC	673	535	0	11.2	0
LC	654	529	2.4	0	0
ID	515	413	3.3	13.6	0
IN	453	354	1.1	4.2	14.1

Table 33

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1978 FORD PINTO - VEHICLE NO. 3

Test		CATALYST TEMPERATURE (°F) Before	After	CATALYST EFFICIENCY (% REDUCTION) HC	CO	NOx
001						
	HC	800	640	79.2	88.7	47.5
	LC	680	610	81.3	83.9	0
	ID	530	520	76.1	97.1	0
	IN	468	541	60.7	95.0	0
002						
	HC	720	580	0	0.1	0
	LC	670	550	0.5	5.6	0
	ID	550	450	0	13.2	0
	IN	490	392	0.2	19.0	0
003						
	HC	730	500	72.4	91.1	37.1
	LC	640	540	85.6	93.0	70.9
	ID	510	490	46.6	95.6	22.8
	IN	478	499	45.1	96.8	28.1
004						
	HC	830	615	63.9	90.9	8.9
	LC	685	600	60.1	100.0	39.4
	ID	495	515	30.4	94.4	12.5
	IN	465	495	33.9	100.0	30.9
005						
	HC	755	480	26.4	92.2	5.8
	LC	655	535	31.0	93.5	38.2
	ID	540	490	19.0	73.1	73.1
	IN	505	455	18.8	94.8	31.5

Table 33 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1978 FORD PINTO - VEHICLE NO. 3

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
006						
	HC	785	555	37.0	91.0	0
	LC	655	565	29.8	92.9	12.1
	ID	500	495	9.0	34.6	52.5
	IN	440	465	8.2	63.2	48.2
023						
	HC	740	560	0	0	2.5
	LC	680	530	0	0	0
	ID	530	415	4.0	23.6	0
	IN	455	340	1.2	11.1	0

Table 34

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 FORD GRANADA - VEHICLE NO. 4

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	760	620	63.4	57.8	2.8
	LC	680	650	73.9	87.9	0
	ID	530	570	77.5	58.3	25.1
	IN	499	480	62.2	74.7	9.1
002						
	HC	-	-	3.3	0	0
	LC	-	-	0	0	0
	ID	-	-	0	0	0
	IN	-	-	0	0	0
003						
	HC	760	560	26.1	0	0
	LC	700	610	20.1	32.9	0
	ID	580	560	23.5	56.5	7.4
	IN	502	490	21.1	33.0	0
004						
	HC	740	540	16.6	0	0.2
	LC	660	560	14.3	0	0
	ID	555	515	16.0	46.4	0
	IN	520	460	22.4	48.7	0
005						
	HC	725	505	17.2	0	0
	LC	685	587	12.9	9.8	0
	ID	550	519	17.9	44.8	10.0
	IN	549	451	19.5	34.9	0
006						
	HC	815	650	17.2	0	0
	LC	705	635	11.1	10.8	0
	ID	575	565	16.3	60.1	0
	IN	515	465	10.9	1.8	1.8

Table 34 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 FORD GRANADA - VEHICLE NO. 4

Test	CATALYST TEMPERATURE (°F)		CATALYST EFFICIENCY (% REDUCTION)		
	Before	After	HC	CO	NOx
023					
HC	755	590	6.6	0	0
LC	655	545	0	4.5	1.9
ID	510	420	3.4	26.5	12.7
IN	480	380	0	0	0

Table 35

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 FORD FAIRMONT FUTURA - VEHICLE NO. 5

Test	CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
	Before	After	HC	CO	NOx
001					
HM	650	470	75.1	94.9	11.2
LM	620	540	78.8	86.2	0.8
ID	480	470	85.2	70.4	41.7
IN	421	412	86.8	82.9	0
002					
HM	680	480	0	0	0
LM	630	480	0	25.5	0
ID	430	340	0	9.2	9.2
IN	406	305	2.8	0	0
003					
HM	660	390	17.3	16.7	0
LM	640	480	23.0	24.1	0
ID	472	410	8.2	36.0	0
IN	418	360	0	41.1	0

Table 35 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 FORD FAIRMONT FUTURA - VEHICLE NO. 5

Test	CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
	Before	After	HC	CO	NOx
004					
HM	695	435	14.9	15.9	0.2
LM	655	505	13.7	24.5	0
ID	500	435	13.8	30.1	6.8
IN	455	375	0	19.9	0
005					
HM	660	430	11.5	20.2	0
LM	600	460	12.3	33.2	0
ID	480	415	4.2	39.3	9.0
IN	440	365	0.1	9.3	0
023					
HM	710	490	0.1	4.9	5.2
LM	635	475	0	0	9.9
ID	455	345	0	2.1	2.1
IN	430	300	0	0	0

Table 36

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET CAMARO Z28 - VEHICLE NO. 6

Test		CATALYST TEMPERATURE (^{o}F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	940	920	53.3	67.1	0
	LC	780	890	49.3	74.6	0
	ID	630	780	84.5	75.0	0.1
	IN	545	724	86.2	66.7	0
002						
	HC	740	620	21.4	0	11.4
	LC	740	676	10.6	0	0
	ID	600	603	0	0	0
	IN	477	537	0	0	0
003						
	HC	790	570	34.5	34.5	0
	LC	760	670	40.6	49.6	0
	ID	590	610	55.7	50.4	0
	IN	500	589	51.3	66.4	0
004						
	HC	730	540	31.4	26.1	0
	LC	740	630	30.2	34.2	0
	ID	560	580	39.2	33.7	0.6
	IN	470	562	16.7	50.0	0.1
005						
	HC	890	758	75.3	20.9	0
	LC	790	800	45.8	26.0	0
	ID	610	700	65.3	48.8	0
	IN	660	615	29.6	50.0	0

Table 36 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET CAMARO Z28 - VEHICLE NO. 6

Test		CATALYST TEMPERATURE (°F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
006						
	HC	788	580	39.7	50.5	0
	LC	758	710	30.9	50.7	0
	ID	541	630	47.1	49.1	0
	IN	448	594	22.2	48.0	0
007						
	HC	866	769	51.8	40.6	0
	LC	792	789	42.4	24.5	0
	ID	612	701	63.6	49.8	0
	IN	499	653	42.2	50.7	1.5
008						
	HC	815	605	38.2	26.1	0
	LC	770	705	28.1	34.3	0
	ID	565	630	44.0	66.6	0
	IN	470	595	34.3	66.1	0
009						
	HC	831	625	43.9	1.9	0
	LC	776	719	39.1	34.2	0
	ID	576	650	45.9	65.9	0
	IN	470	615	34.6	66.4	0
010						
	HC	775	550	22.8	32.9	0
	LC	745	655	32.9	34.3	0
	ID	575	605	31.0	66.0	0
	IN	480	580	14.5	66.7	0.2
023						
	HC	740	630	24.3	0	0
	LC	735	675	14.9	0	0
	ID	610	615	0	0	0
	IN	515	560	0	0.1	0

Table 37

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET MALIBU CLASSIC - VEHICLE NO. 7

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	720	480	93.4	89.5	83.4
	LC	690	620	95.0	88.3	53.3
	ID	580	560	92.3	84.2	85.4
	IN	510	520	98.9	92.5	40.1
002						
	HC	650	660	6.2	0	0
	LC	600	590	0	0	2.2
	ID	490	450	0	0	3.5
	IN	428	380	4.5	0	0
003						
	HC	730	530	42.7	12.0	73.1
	LC	580	660	46.5	17.6	77.0
	ID	515	500	13.8	19.2	45.2
	IN	470	480	50.9	47.6	67.5
004						
	HC	710	540	25.6	6.9	45.7
	LC	635	585	23.4	20.2	44.0
	ID	535	525	4.5	0	14.6
	IN	470	470	24.3	32.7	28.5
005						
	HC	770	600	14.8	12.2	21.1
	LC	715	655	3.3	6.5	18.8
	ID	550	550	0	0	16.8
	IN	485	510	6.4	30.8	0.6

Table 37 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 CHEVROLET MALIBU CLASSIC - VEHICLE NO. 7

Test		CATALYST TEMPERATURE (^{o}F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
006						
	HC	665	524	18.2	6.9	56.5
	LC	619	557	21.5	26.2	53.5
	ID	513	503	5.7	22.6	38.2
	IN	461	474	15.9	38.4	19.7
023						
	HC	595	608	4.7	0	3.1
	LC	604	602	0	0	0
	ID	511	491	0	0	11.1
	IN	450	423	4.8		16.8

Table 38

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 PONTIAC SUNBIRD - VEHICLE NO. 8

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	540	601	92.6	91.8	68.4
	LC	610	632	93.9	92.0	41.9
	ID	NO IDLE-D				
	IN	561	593	91.8	92.7	33.0
002						
	HC	445	498	0	9.9	0
	LC	525	547	0	0	2.9
	ID		NO IDLE-D			
	IN	479	481	0	0	0.4
003						
	HC	-	-	-	-	-
	LC	-	-	-	-	-
	ID		NO IDLE-D			
	IN	-	-	-	-	-
004						
	HC	412	450	41.3	52.7	85.5
	LC	563	543	64.4	65.7	61.4
	ID		NO IDLE-D			
	IN	506	506	75.4	74.9	43.6
005						
	HC	430	480	41.1	61.4	85.5
	LC	515	540	69.0	80.9	73.7
	ID		NO IDLE-D			
	IN	445	515	74.5	90.5	44.1

Table 38 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1979 PONTIAC SUNBIRD - VEHICLE NO. 8

Test		CATALYST TEMPERATURE (^{o}F) Before	 After		CATALYST EFFICIENCY (% REDUCTION) HC	 CO	 NOx
006							
	HC	515	523		15.6	55.5	84.2
	LC	599	581		58.9	60.3	76.1
	ID			NO IDLE-D			
	IN	536	536		81.2	77.8	42.7
007							
	HC	425	495		6.4	34.8	86.8
	LC	520	515		64.4	80.9	48.1
	ID			NO IDLE-D			
	IN	470	500		77.6	82.4	28.6
008							
	HC	483	543		4.7	52.9	77.9
	LC	582	601		40.2	64.8	58.3
	ID			NO IDLE-D			
	IN	530	561		74.0	93.2	33.6
023							
	HC	492	530		0	7.2	0
	LC	560	568		9.1	0	1.1
	ID			NO IDLE-D			
	IN	492	470		4.8	0	0.7

Table 39

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1977 VOLVO MODEL 242 - VEHICLE NO. 9

Test		CATALYST TEMPERATURE (^0F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	750	670	59.8	76.0	97.3
	LC	700	630	46.5	65.2	93.8
	ID	480	510	73.2	90.4	90.7
	IN	459	474	75.3	92.2	39.8
002						
	HC	730	570	15.5	0	13.5
	LC	650	540	0	0	1.4
	ID	550	460	0	9.8	0
	IN	518	428	0	0	0
003						
	HC	770	550	1.1	29.3	79.7
	LC	670	590	7.4	18.2	45.3
	ID	520	530	0	15.7	32.8
	IN	480	475	0.1	20.1	33.7
004						
	HC	850	658	4.7	47.2	63.8
	LC	731	640	5.3	37.5	43.8
	ID	590	560	0	35.1	33.3
	IN	590	560	0	44.4	20.6
005						
	HC	728	523	0	47.1	66.8
	LC	675	591	4.2	37.5	34.7
	ID	514	525	3.7	45.4	19.5
	IN	480	466	7.3	45.1	39.6

Table 39 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1977 VOLVO MODEL 242 - VEHICLE NO. 9

Test		CATALYST TEMPERATURE (^{o}F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
006						
	HC	901	537	1.6	60.7	51.3
	LC	693	594	4.9	56.4	34.1
	ID	540	530	0	65.2	39.5
	IN	497	477	0	70.4	40.1
007						
	HC	830	660	0.6	46.1	34.3
	LC	670	600	8.7	49.0	29.7
	ID	530	535	1.0	54.9	34.3
	IN	485	480	9.0	68.3	20.0
008						
	HC	690	440	2.4	77.5	51.9
	LC	660	570	2.2	72.0	57.2
	ID	510	510	9.6	86.4	50.9
	IN	460	645	0.6	87.4	20.7
009						
	HC	800	620	7.8	81.7	38.3
	LC	660	590	8.4	84.3	16.9
	ID	525	530	8.0	86.2	0
	IN	480	485	4.6	85.2	0
010						
	HC	770	595	6.6	75.5	69.7
	LC	685	620	9.7	90.1	38.6
	ID	555	555	12.5	93.1	0
	IN	475	490	8.3	86.2	0
011						
	HC	798	667	1.4	77.2	61.5
	LC	692	649	9.3	86.2	40.0
	ID	538	564	13.7	88.3	16.9
	IN	495	525	0	87.8	0

Table 40

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1977 VOLVO MODEL 242 - VEHICLE NO. 10

Test		CATALYST TEMPERATURE (^{o}F)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
001						
	HC	810	677	80.0	92.2	95.6
	LC	680	650	81.4	91.6	89.4
	ID	550	580	72.6	85.8	38.4
	IN	503	530	35.5	75.7	38.4
002						
	HC	800	645	0.3	0	5.6
	LC	690	590	0	0	0
	ID	535	460	8.2	0	0
	IN	498	407	0	7.0	0
003						
	HC	820	670	7.1	61.6	90.1
	LC	680	640	3.0	23.0	51.8
	ID	465	494	0.5	12.5	17.3
	IN	465	425	0.5	27.4	34.0
004						
	HC	750	545	7.3	65.0	88.5
	LC	665	590	2.8	43.3	50.2
	ID	500	520	0	40.1	14.3
	IN	455	415	6.7	4.3	14.0

Table 40 (Continued)

WORK EFFORT NO. 2 - CATALYST POISONING TESTS

CATALYST TEMPERATURE AND EFFICIENCY

FEDERAL THREE CYCLE TESTS

1977 VOLVO MODEL 242 - VEHICLE NO. 10

Test		CATALYST TEMPERATURE (^oF)		CATALYST EFFICIENCY (% REDUCTION)		
		Before	After	HC	CO	NOx
005						
	HC	710	520	9.1	0	1.7
	LC	645	535	0	0	2.9
	ID	525	445	0	0	0
	IN	480	390	0	0	0
023						
	HC	820	655	5.9	0	0
	LC	665	565	0	5.9	0
	ID	490	415	0	0	0.4
	IN	460	375	0	3.6	0

Table 31-A

Federal 3-Mode Test Data

Car No. 1

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	28	.15	491	11.29
		After	14	.05	468	11.57
	25	Before	19	.15	247	11.57
		After	9	.05	290	11.57
	Idle (Neutral)	Before	70	.15	225	9.51
		After	14	.05	183	9.51
	Idle (Drive)	Before	109	.15	121	8.17
		After	19	.05	121	8.38
002	52	Before	47	.15	445	10.50
		After	42	.15	468	10.50
	25	Before	42	.15	268	10.76
		After	47	.15	290	10.76
	Idle (Neutral)	Before	119	.10	121	8.38
		After	128	.10	121	8.38
	Idle (Drive)	Before	153	.15	100	7.75
		After	168	.15	100	7.55
003	52	Before	47	.15	333	10.50
		After	28	.10	377	10.76
	25	Before	42	.15	162	11.02
		After	23	.10	204	11.02
	Idle (Neutral)	Before	63	.10	100	8.60
		After	75	.05	80	8.82
	Idle (Drive)	Before	153	.15	60	7.75
		After	85	.05	40	7.96
004	52	Before	32	.15	483	11.05
		After	51	.25	438	10.83
	25	Before	37	.15	201	10.83
		After	60	.25	222	11.05
	Idle (Neutral)	Before	113	.10	79	8.92
		After	172	.20	99	8.72
	Idle (Drive)	Before	103	.10	59	7.95
		After	147	.20	59	7.95
005	52	Before	37	.20	180	10.38
		After	18	.15	222	10.60
	25	Before	28	.20	139	11.28
		After	14	.10	160	11.28
	Idle (Neutral)	Before	182	.15	79	8.72
		After	70	.10	79	8.92
	Idle (Drive)	Before	162	.20	39	7.95
		After	84	.10	39	7.95

Federal 3 Cycle Tests

Car No. 1 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	60	.20	160	10.17
		After	32	.15	201	10.38
	25	Before	42	.20	160	11.28
		After	23	.15	180	11.51
	Idle (Neutral)	Before	212	.15	59	8.72
		After	94	.10	79	8.72
	Idle (Drive)	Before	167	.20	59	7.95
		After	103	.10	59	8.14
007	52	Before	65	.10	139	10.17
		After				
	25	Before	46	.15	139	11.28
		After				
	Idle (Neutral)	Before	212	.10	59	8.92
		After				
	Idle (Drive)	Before	137	.10	39	8.14
		After				
008	52	Before	37	.15	201	10.38
		After	18	.10	243	10.38
	25	Before	28	.15	160	11.05
		After	14	.05	201	11.05
	Idle (Neutral)	Before	217	.10	79	8.52
		After	94	.05	79	8.72
	Idle (Drive)	Before	137	.15	59	7.76
		After	94	.05	59	7.95
009	52	Before	84	.25	160	9.95
		After	51	.15	180	10.17
	25	Before	37	.20	139	10.83
		After	23	.10	160	11.05
	Idle (Neutral)	Before	232	.10	59	8.52
		After	108	.10	79	8.72
	Idle (Drive)	Before	162	.15	59	7.95
		After	118	.05	59	7.95
010	52	Before	75	.20	160	10.17
		After	56	.15	201	10.38
	25	Before	42	.15	119	10.83
		After	23	.10	180	11.05
	Idle (Neutral)	Before	207	.15	79	8.92
		After	98	.05	99	9.12
	Idle (Drive)	Before	113	.15	59	8.14
		After	75	.05	59	8.14

Federal 3 Cycle Tests

Car No. 1 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
011	52	Before	42	.20	160	10.17
		After	28	.10	180	10.17
	25	Before	84	.15	119	10.17
		After	46	.10	139	10.38
	Idle (Neutral)	Before	207	.15	119	8.92
		After	94	.05	160	9.12
	Idle (Drive)	Before	127	.15	59	7.95
		After	103	.05	79	8.14
012	52	Before	118	.20	180	9.95
		After	84	.10	222	10.17
	25	Before	46	.15	139	10.83
		After	28	.10	180	10.83
	Idle (Neutral)	Before	237	.10	79	8.72
		After	137	.05	79	8.72
	Idle (Drive)	Before	152	.10	59	7.95
		After	94	.05	59	7.95
013	52	Before	94	.25	201	9.95
		After	84	.25	180	9.95
	25	Before	56	.20	79	10.38
		After	51	.20	99	9.95
	Idle (Neutral)	Before	152	.15	59	8.72
		After	152	.15	79	8.72
	Idle (Drive)	Before	127	.20	39	7.95
		After	162	.20	39	7.76

Table 32-A

Federal - 3 Cycle Tests Data

Car No. 2

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	66	.99	1187	13.04
		After	14	.05	537	9.99
	25	Before	104	.64	422	13.67
		After	14	.05	100	9.51
	Idle (Neutral)	Before	123	3.37	204	12.43
		After	19	.05	141	9.51
	Idle (Drive)	Before	85	2.39	183	13.04
		After	14	.05	121	8.38
002	52	Before	75	.47	1458	14.33
		After	85	.42	1490	14.33
	25	Before	123	.57	422	14.00
		After	119	.64	422	14.00
	Idle (Neutral)	Before	148	3.53	162	12.73
		After	143	3.29	162	12.73
	Idle (Drive)	Before	104	2.75	162	13.35
		After	99	2.60	162	13.35
003	52	Before	75	.88	1102	13.35
		After	14	.05	682	9.75
	25	Before	128	.76	377	13.67
		After	23	.05	100	9.51
	Idle (Neutral)	Before	148	3.29	162	12.43
		After	28	.10	121	9.28
	Idle (Drive)	Before	90	2.46	162	13.04
		After	19	.05	60	8.17
004	52	Before	177	1.26	896	13.21
		After	65	.10	647	10.17
	25	Before	278	.79	285	13.72
		After	123	.05	139	9.74
	Idle (Neutral)	Before	342	4.59	119	11.99
		After	113	.57	59	9.32
	Idle (Drive)	Before	212	3.52	119	12.47
		After	70	.20	59	8.33
005	52	Before	192	1.14	975	12.96
		After	70	.05	720	9.95
	25	Before	310	.85	350	13.46
		After	162	.05	201	9.53
	Idle (Neutral)	Before	347	4.04	119	11.99
		After	177	1.32	59	8.14
	Idle (Drive)	Before	192	2.89	119	12.71
		After	94	.57	59	7.58

Federal 3 Cycle Tests

Car No. 2 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	207	1.14	1029	12.96
		After	75	.10	744	9.74
	25	Before	321	.85	350	13.46
		After	172	.10	201	9.53
	Idle (Neutral)	Before	369	4.40	119	11.75
		After	192	1.76	59	7.76
	Idle (Drive)	Before	207	3.28	119	12.47
		After	103	1.08	79	7.04
023	52	Before	142	.52	1528	13.98
		After	147	.46	1725	13.98
	25	Before	202	.57	416	13.98
		After	197	.57	416	13.98
	Idle (Neutral)	Before	217	3.12	160	12.96
		After	207	2.66	160	13.21
	Idle (Drive)	Before	132	2.30	160	13.21
		After	132	2.23	139	13.46

Table 33-A

Federal - 3 Cycle Tests Data

Car No. 3

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	90	.59	1074	12.43
		After	14	.05	422	9.75
	25	Before	138	.42	1187	12.43
		After	19	.05	121	9.51
	Idle (Neutral)	Before	153	2.75	183	11.57
		After	23	.05	141	9.05
	Idle (Drive)	Before	99	1.69	183	12.14
		After	23	.05	121	8.17
002	52	Before	94	.53	1335	14.00
		After	109	.53	1396	14.00
	25	Before	178	3.45	183	13.04
		After	183	3.21	183	13.04
	Idle (Neutral)	Before	148	.70	445	14.33
		After	143	.59	468	14.00
	Idle (Drive)	Before	123	2.24	162	13.67
		After	119	1.76	162	13.67
003	52	Before	104	.70	1158	13.35
		After	23	.05	585	11.29
	25	Before	173	.93	633	13.04
		After	19	.05	141	10.76
	Idle (Neutral)	Before	193	3.53	162	12.14
		After	66	.10	80	9.99
	Idle (Drive)	Before	114	2.60	141	12.73
		After	37	.05	60	9.05
004	52	Before	222	.68	975	13.72
		After	65	.05	720	11.75
	25	Before	374	.90	484	13.46
		After	113	.00	222	11.05
	Idle (Neutral)	Before	358	2.73	139	12.96
		After	162	0.10	79	10.17
	Idle (Drive)	Before	207	1.89	139	13.21
		After	84	.00	59	9.32
005	52	Before	222	.79	1111	13.46
		After	132	.05	845	11.51
	25	Before	396	1.02	794	13.21
		After	207	.05	372	10.83
	Idle (Neutral)	Before	358	2.30	160	12.96
		After	192	.41	59	9.74
	Idle (Drive)	Before	187	1.56	139	13.21
		After	94	.05	59	9.12

Car No. 3 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	258	.68	1111	13.46
		After	132	.05	922	11.51
	25	Before	424	.90	416	13.21
		After	232	.05	285	11.05
	Idle (Neutral)	Before	435	3.61	119	12.22
		After	273	1.63	39	9.32
	Idle (Drive)	Before	253	2.66	119	12.71
		After	147	.62	39	9.12
023	52	Before	137	.52	1560	13.98
		After	157	.57	1528	13.98
	25	Before	227	.57	461	13.98
		After	227	.57	484	13.72
	Idle (Neutral)	Before	237	2.44	139	13.21
		After	222	1.82	160	13.46
	Idle (Drive)	Before	123	1.32	119	13.98
		After	118	1.14	139	13.72

Table 34-A

Federal - 3 Cycle Tests Data

Car No. 4

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	99	.26	911	11.02
		After	33	.10	807	10.24
	25	Before	109	.42	290	10.76
		After	28	.05	290	11.02
	Idle (Neutral)	Before	85	.10	445	9.51
		After	23	.05	400	11.57
	Idle (Drive)	Before	51	.20	204	13.67
		After	19	.05	183	13.67
002	52	Before	99	.20	706	11.02
		After	94	.26	731	10.76
	25	Before	109	.70	537	10.50
		After	109	.70	537	10.24
	Idle (Neutral)	Before	99	.10	333	12.43
		After	99	.10	355	12.43
	Idle (Drive)	Before	51	.15	162	12.14
		After	51	.15	162	12.14
003	52	Before	94	.15	807	10.76
		After	66	.15	807	10.24
	25	Before	114	.47	247	10.50
		After	89	.31	247	10.50
	Idle (Neutral)	Before	75	.10	333	9.05
		After	66	.05	355	10.50
	Idle (Drive)	Before	42	.15	162	12.43
		After	33	.10	162	12.43
004	52	Before	177	.20	576	10.60
		After	142	.25	553	10.17
	25	Before	172	.25	160	10.38
		After	147	.25	180	10.38
	Idle (Neutral)	Before	167	.25	243	9.53
		After	157	.15	285	10.83
	Idle (Drive)	Before	94	.36	119	12.47
		After	79	.20	139	13.72
005	52	Before	192	.20	695	10.83
		After	152	.20	695	10.83
	25	Before	197	.41	222	10.60
		After	167	.36	222	10.38
	Idle (Neutral)	Before	157	.25	285	9.32
		After	187	.20	372	13.72
	Idle (Drive)	Before	94	.31	160	13.72
		After	75	.20	160	13.72

Federal 3 Cycle Tests

Car No. 4 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	192	.25	671	10.83
		After	152	.25	647	10.83
	25	Before	212	.52	201	10.83
		After	187	.46	201	10.83
	Idle (Neutral)	Before	187	.25	264	9.53
		After	157	.10	285	9.74
	Idle (Drive)	Before	108	.25	139	13.40
		After	98	.25	139	13.72
023	52	Before	123	.15	794	10.60
		After	113	.20	794	10.38
	25	Before	142	.73	553	10.17
		After	142	.68	529	9.95
	Idle (Neutral)	Before	108	.15	350	9.12
		After	142	.15	419	12.47
	Idle (Drive)	Before	60	.25	119	12.22
		After	60	.25	119	12.22

Table 35-A

Federal - 3 Cycle Tests Data

Car No. 5

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	144	.99	355	11.57
		After	28	.05	311	12.43
	25	Before	173	.36	162	11.02
		After	37	.05	162	11.57
	Idle (Neutral)	Before	198	.15	247	10.24
		After	33	.05	162	11.85
	Idle (Drive)	Before	343	.26	100	10.76
		After	51	.05	121	12.73
002	52	Before	123	.88	311	11.57
		After	123	.88	311	11.57
	25	Before	153	.36	268	11.02
		After	153	.26	268	10.76
	Idle (Neutral)	Before	249	.15	183	11.29
		After	285	.15	183	12.43
	Idle (Drive)	Before	178	.26	121	11.85
		After	173	.26	121	11.85
003	52	Before	183	.70	311	11.29
		After	153	.59	333	11.57
	25	Before	306	.20	141	10.76
		After	233	.15	183	10.76
	Idle (Neutral)	Before	437	.15	100	10.24
		After	418	.10	121	10.76
	Idle (Drive)	Before	1176	.26	100	10.50
		After	1287	.20	100	10.24
004	52	Before	237	1.14	264	11.51
		After	202	.96	264	11.75
	25	Before	310	.62	119	11.05
		After	263	.46	139	11.05
	Idle (Neutral)	Before	347	.20	243	11.28
		After	321	.15	243	12.22
	Idle (Drive)	Before	585	.25	99	12.71
		After	622	.20	119	12.71
005	52	Before	253	1.44	285	11.05
		After	222	1.14	285	11.28
	25	Before	890	.62	139	10.83
		After	773	.41	160	11.05
	Idle (Neutral)	Before	735	.15	243	10.83
		After	773	.10	243	11.99
	Idle (Drive)	Before	773	.20	99	11.51
		After	851	.20	119	12.71

Federal 3 Cycle Tests

Car No. 5 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
023	52	Before	137	.85	285	11.51
		After	137	.79	264	11.28
	25	Before	167	.57	222	10.83
		After	172	.62	201	10.83
	Idle (Neutral)	Before	232	.25	264	12.22
		After	247	.25	264	12.47
	Idle (Drive)	Before	273	.31	99	12.96
		After	278	.31	99	12.96

Table 36-A

Federal - 3 Cycle Tests Data

Car No. 6

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	19	.15	377	11.02
		After	9	.05	445	11.29
	25	Before	28	.20	225	11.02
		After	14	.05	268	11.02
	Idle (Neutral)	Before	90	.20	121	9.75
		After	14	.05	121	9.99
	Idle (Drive)	Before	138	.15	80	9.05
		After	19	.05	100	9.28
002	52	Before	42	.15	183	10.50
		After	33	.15	162	10.50
	25	Before	47	.15	100	10.24
		After	42	.15	121	10.24
	Idle (Neutral)	Before	89	.15	100	9.75
		After	99	.15	100	9.51
	Idle (Drive)	Before	193	.15	80	8.82
		After	193	.15	80	8.82
003	52	Before	42	.15	204	9.99
		After	28	.10	225	10.24
	25	Before	56	.10	121	9.99
		After	33	.05	162	9.99
	Idle (Neutral)	Before	168	.10	80	9.05
		After	75	.05	100	9.28
	Idle (Drive)	Before	348	.15	80	8.38
		After	168	.05	80	8.60
004	52	Before	46	.20	160	9.95
		After	32	.15	201	10.16
	25	Before	65	.15	79	9.95
		After	46	.10	119	10.16
	Idle (Neutral)	Before	232	.15	39	8.72
		After	142	.10	39	8.92
	Idle (Drive)	Before	475	.20	39	7.95
		After	396	.10	39	8.14
005	52	Before	56	.25	201	10.38
		After	14	.20	264	10.60
	25	Before	51	.20	139	10.38
		After	28	.15	160	10.60
	Idle (Neutral)	Before	177	.20	59	9.53
		After	60	.10	79	9.53
	Idle (Drive)	Before	294	.20	39	8.52
		After	207	.10	59	8.72

Federal 3 Cycle Tests

Car No. 6 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	46	.20	180	9.95
		After	28	.10	243	10.17
	25	Before	60	.10	139	10.17
		After	42	.05	180	10.38
	Idle (Neutral)	Before	227	.10	59	9.32
		After	118	.05	79	9.32
	Idle (Drive)	Before	310	.10	39	8.38
		After	232	.05	39	8.18
007	52	Before	37	.25	243	10.38
		After	18	.15	307	10.60
	25	Before	56	.20	139	10.17
		After	32	.15	160	10.17
	Idle (Neutral)	Before	207	.20	79	9.12
		After	75	.10	79	9.32
	Idle (Drive)	Before	353	.20	59	8.33
		After	207	.10	59	8.72
008	52	Before	51	.20	201	9.95
		After	32	.15	264	10.17
	25	Before	70	.15	119	9.74
		After	51	.10	160	9.95
	Idle (Neutral)	Before	263	.15	59	8.72
		After	147	.05	79	8.92
	Idle (Drive)	Before	622	.15	59	7.95
		After	402	.05	59	8.14
009	52	Before	56	.15	180	9.95
		After	32	.15	223	10.17
	25	Before	60	.15	139	10.17
		After	37	.10	180	10.38
	Idle (Neutral)	Before	223	.15	59	9.12
		After	118	.05	79	9.12
	Idle (Drive)	Before	413	.15	59	8.33
		After	268	.05	59	8.52
021	52	Before	60	.15	160	9.74
		After	46	.10	201	9.74
	25	Before	75	.15	119	9.95
		After	51	.10	160	10.17
	Idle (Neutral)	Before	217	.15	59	8.92
		After	147	.05	59	8.92
	Idle (Drive)	Before	469	.15	39	7.95
		After	402	.05	39	8.14

Federal 3 Cycle Tests

Car No. 6 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
023	52	Before	37	.20	139	10.38
		After	28	.20	160	10.38
	25	Before	60	.15	59	9.95
		After	51	.15	79	9.95
	Idle (Neutral)	Before	108	.15	59	9.74
		After	123	.15	79	9.53
	Idle (Drive)	Before	217	.15	39	8.72
		After	222	.15	59	8.72

Table 37-A

Federal - 3 Cycle Tests Data

Car No. 7

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	75	.47	964	14.33
		After	5	.05	162	15.03
	25	Before	99	.42	657	14.00
		After	5	.05	311	14.68
	Idle (Neutral)	Before	114	.31	268	14.33
		After	9	.05	40	15.03
	Idle (Drive)	Before	481	.70	141	14.33
		After	5	.05	80	14.68
002	52	Before	80	.53	991	14.33
		After	75	.53	1046	14.33
	25	Before	128	.53	1490	14.00
		After	128	.53	1458	14.00
	Idle (Neutral)	Before	119	.31	268	14.33
		After	114	.31	247	13.67
	Idle (Drive)	Before	75	.42	162	14.00
		After	70	.42	162	13.67
003	52	Before	137	.96	975	13.72
		After	79	.85	264	13.98
	25	Before	202	.96	695	13.72
		After	108	.79	160	13.98
	Idle (Neutral)	Before	222	.90	180	13.98
		After	192	.73	99	14.24
	Idle (Drive)	Before	113	.68	119	13.98
		After	56	.36	39	14.50
004	52	Before	157	1.02	922	13.72
		After	118	.96	506	13.98
	25	Before	247	1.26	819	13.46
		After	192	1.02	461	13.98
	Idle (Neutral)	Before	118	.85	139	13.98
		After	113	.90	119	13.98
	Idle (Drive)	Before	118	.85	139	13.98
		After	89	.57	99	14.42
005	52	Before	177	.96	695	13.72
		After	152	.85	553	13.98
	25	Before	247	1.14	506	13.46
		After	242	1.08	416	13.72
	Idle (Neutral)	Before	294	1.95	119	13.21
		After	299	1.95	99	13.21
	Idle (Drive)	Before	172	1.38	79	13.46
		After	162	.96	79	13.98

Federal 3 Cycle Tests

Car No. 7 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	202	1.02	896	13.46
		After	167	.96	394	13.72
	25	Before	305	1.14	744	13.46
		After	242	.85	350	13.98
	Idle (Neutral)	Before	284	1.02	160	13.72
		After	268	.79	99	13.98
	Idle (Drive)	Before	152	0.85	99	13.72
		After	127	.52	79	13.98
023	52	Before	113	.52	949	13.98
		After	108	.57	922	13.98
	25	Before	142	.52	1029	13.98
		After	147	.52	1029	13.98
	Idle (Neutral)	Before	137	.31	180	13.98
		After	142	.31	160	13.98
	Idle (Drive)	Before	103	.36	119	13.98
		After	98	.36	99	13.98

Table 38-A

Federal - 3 Cycle Tests Data

Car No. 8

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	66	.59	1158	14.00
		After	5	.05	377	15.03
	25	Before	61	.47	290	10.76
		After	5	.05	225	15.03
	Idle (Neutral)	Before	47	.53	162	10.76
		After	5	.05	141	14.68
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
002	52	Before	75	.59	964	14.00
		After	85	.53	991	14.00
	25	Before	89	.64	884	14.00
		After	89	.64	858	14.00
	Idle (Neutral)	Before	66	.59	183	14.00
		After	70	.64	183	14.00
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
003	52	Before	187	1.89	949	13.21
		After	182	1.69	222	13.46
	25	Before	299	2.16	1029	12.96
		After	294	1.89	264	13.46
	Idle (Neutral)	Before	253	6.35	119	10.83
		After	258	6.24	99	10.83
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
004	52	Before	132	.85	1084	13.46
		After	79	.41	160	14.24
	25	Before	182	.90	307	13.46
		After	65	.31	119	14.24
	Idle (Neutral)	Before	113	.79	139	13.46
		After	28	.20	79	14.24
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
005	52	Before	157	.79	1084	13.46
		After	94	.31	160	14.24
	25	Before	289	.79	1759	13.46
		After	89	.15	461	14.24
	Idle (Neutral)	Before	108	.52	139	13.46
		After	28	.05	79	14.24
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				

Federal 3 Cycle Tests

Car No. 8 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	172	1.02	1254	13.46
		After	147	.46	201	14.24
	25	Before	227	.90	328	13.46
		After	94	.36	79	14.24
	Idle (Neutral)	Before	123	.68	139	13.72
		After	23	.15	79	14.24
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
007	52	Before	177	.68	1465	13.72
		After	172	.46	201	14.50
	25	Before	305	.79	2046	13.46
		After	108	.15	1056	14.24
	Idle (Neutral)	Before	105	.57	139	13.72
		After	23	.10	99	14.24
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
008	52	Before	197	.85	1168	13.46
		After	192	.41	264	14.24
	25	Before	237	1.02	119	14.24
		After	142	.36	119	14.24
	Idle (Neutral)	Before	123	.73	119	13.46
		After	32	.05	79	14.24
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				
023	52	Before	113	.79	1056	13.72
		After	118	.73	1111	
	25	Before	123	.79	647	13.72
		After	113	.96	647	
	Idle (Neutral)	Before	98	.62	139	13.72
		After	94	.73	139	
	Idle (Drive)	Before	N.A.	N.A.	N.A.	N.A.
		After				

Table 39-A

Federal - 3 Cycle Tests Data

Car No. 9

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	106	.64	1490	14.00
		After	43	.15	40	14.68
	25	Before	133	.76	657	14.00
		After	70	.26	40	14.33
	Idle (Neutral)	Before	133	.53	100	14.00
		After	35	.05	60	14.33
	Idle (Drive)	Before	142	.64	100	13.67
		After	35	.05	60	14.33
002	52	Before	33	.64	1790	14.00
		After	28	.70	1554	14.00
	25	Before	37	.59	682	14.00
		After	37	.59	657	13.67
	Idle (Neutral)	Before	37	.59	121	13.67
		After	37	.53	121	13.67
	Idle (Drive)	Before	47	.59	121	13.35
		After	47	.59	121	13.35
003	52	Before	98	1.26	1496	13.72
		After	98	.90	307	14.24
	25	Before	137	1.32	599	13.72
		After	127	1.08	328	13.98
	Idle (Neutral)	Before	98	1.08	119	13.98
		After	103	.90	79	13.98
	Idle (Drive)	Before	108	1.20	119	13.72
		After	108	.96	79	13.98
004	52	Before	108	1.08	1592	13.72
		After	103	.57	576	14.24
	25	Before	123	.90	576	13.72
		After	118	.57	328	14.24
	Idle (Neutral)	Before	108	.96	119	13.72
		After	108	.62	79	13.98
	Idle (Drive)	Before	94	1.02	99	13.72
		After	98	.57	79	13.72
005	52	Before	113	.96	1625	13.46
		After	123	.52	553	14.24
	25	Before	147	1.08	599	13.46
		After	142	.68	394	13.98
	Idle (Neutral)	Before	108	.85	99	13.72
		After	103	.46	79	13.98
	Idle (Drive)	Before	118	.96	99	13.72
		After	108	.52	49	13.98

Federal 3 Cycle Tests

Car No. 9 (Continued)

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
006	52	Before	123	.90	1759	13.46
		After	123	.36	871	14.24
	25	Before	147	.96	576	13.72
		After	137	.41	372	13.98
	Idle (Neutral)	Before	123	.73	99	13.72
		After	127	.25	59	13.98
	Idle (Drive)	Before	127	.85	99	13.72
		After	132	.25	59	14.24
007	52	Before	132	.96	1899	14.46
		After	132	.52	1254	13.98
	25	Before	172	1.02	720	13.46
		After	157	.52	506	13.98
	Idle (Neutral)	Before	98	.68	119	13.72
		After	98	.31	79	14.24
	Idle (Drive)	Before	98	.79	99	13.72
		After	89	.25	79	14.24
008	52	Before	137	.90	1725	13.72
		After	132	.20	819	14.24
	25	Before	162	.90	623	13.72
		After	157	.25	264	14.24
	Idle (Neutral)	Before	103	.73	119	13.72
		After	94	.10	59	14.50
	Idle (Drive)	Before	84	.79	99	13.72
		After	84	.10	79	14.50
009	52	Before	132	1.08	1828	13.46
		After	132	.20	1139	14.50
	25	Before	172	.96	695	13.46
		After	157	.15	579	14.24
	Idle (Neutral)	Before	103	.73	99	13.46
		After	94	.10	99	13.98
	Idle (Drive)	Before	79	.68	99	13.21
		After	75	.10	99	13.72
010	52	Before	127	1.08	1658	13.46
		After	127	.25	647	14.50
	25	Before	172	1.08	599	13.46
		After	157	.15	416	14.50
	Idle (Neutral)	Before	103	.85	119	13.46
		After	89	.10	99	14.24
	Idle (Drive)	Before	79	.85	99	13.46
		After	84	.10	99	13.72

Table 40-A

Federal - 3 Cycle Tests Data

Car No. 10

Test No.	Mode	Catalyst	HC ppm	CO %	NOx ppm	CO_2 %
001	52	Before	70	.64	2282	14.00
		After	14	.05	100	14.68
	25	Before	75	.59	937	14.00
		After	14	.05	100	14.68
	Idle (Neutral)	Before	51	.70	162	14.00
		After	14	.10	100	14.68
	Idle (Drive)	Before	51	.82	162	14.00
		After	33	.20	100	14.68
002	52	Before	70	.59	2408	14.00
		After	70	.64	2282	14.00
	25	Before	80	.70	1102	14.00
		After	70	.70	1130	14.00
	Idle (Neutral)	Before	61	.82	141	13.67
		After	56	.82	141	13.67
	Idle (Drive)	Before	61	.82	141	13.67
		After	66	.76	141	13.67
003	52	Before	123	1.08	2046	13.72
		After	113	.41	201	14.24
	25	Before	157	1.25	819	13.72
		After	152	.96	394	13.98
	Idle (Neutral)	Before	98	1.50	119	13.46
		After	98	1.32	99	13.72
	Idle (Drive)	Before	70	1.63	119	13.46
		After	70	1.19	79	13.98
004	52	Before	152	1.02	2280	13.46
		After	142	.36	264	14.24
	25	Before	177	1.20	1111	13.46
		After	172	.68	553	13.98
	Idle (Neutral)	Before	89	1.32	139	13.46
		After	89	.79	119	13.98
	Idle (Drive)	Before	70	1.26	139	13.72
		After	62	1.20	119	13.72
023	52	Before	98	.79	2200	13.98
		After	89	.79	2161	13.98
	25	Before	103	.73	949	13.98
		After	103	.73	922	13.98
	Idle (Neutral)	Before	56	.62	98	14.24
		After	56	.62	99	14.24
	Idle (Drive)	Before	56	.68	98	14.24
		After	60	.62	99	14.24

Tables 41 - 50

Loaded Mode Test Data

Tables 41-50 list the normalized emission data while Tables 41A-50A list the "as measured" raw emission data. The units for the reported pollutants are:

HC in ppm
CO in %
NOx in ppm
CO_2 in %

Table 41

Normalized Emission Data
Loaded Mode Tests

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	10	.05	355	14.94
		Low Cruise	11	.06	365	14.92
		Idle	16	.09	210	14.90
	No	High Cruise	66	4.30	179	10.63
		Low Cruise	14	.05	361	14.93
		Idle	11	.06	145	14.93
002	Yes	High Cruise	15	1.36	303	13.63
		Low Cruise	25	.20	294	14.78
		Idle	108	.18	144	14.70
	No	High Cruise	75	2.30	377	12.60
		Low Cruise	44	.16	352	14.79
		Idle	122	.25	99	14.62
003	Yes	High Cruise	10	.38	218	14.60
		Low Cruise	7	.07	327	14.93
		Idle	9	.09	182	14.90
	No	High Cruise	107	2.35	328	12.53
		Low Cruise	36	.11	315	14.85
		Idle	45	.06	123	14.89
004	Yes	High Cruise	21	.51	343	14.46
		Low Cruise	12	.13	320	14.86
		Idle	25	.18	125	14.80
	No	High Cruise	109	2.09	381	12.79
		Low Cruise	30	.16	331	14.81
		Idle	44	.12	94	14.83
005	Yes	High Cruise	20	.64	309	14.31
		Low Cruise	7	.13	265	14.86
		Idle	16	.18	140	14.80
	No	High Cruise	108	2.26	355	12.62
		Low Cruise	10	.22	295	14.77
		Idle	22	.12	120	14.85
006	Yes	High Cruise	30	.86	287	14.11
		Low Cruise	0	.13	293	14.87
		Idle	16	.18	105	14.80
	No	High Cruise	113	2.26	313	12.62
		Low Cruise	10	.17	244	14.82
		Idle	46	.12	98	14.83

Table 41 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	46	.99	290	13.96
		Low Cruise	12	.19	231	14.79
		Idle	32	.18	105	14.79
	No	High Cruise	116	1.61	388	13.27
		Low Cruise	20	.17	249	14.81
		Idle	62	.12	96	14.81
008	Yes	High Cruise	26	.51	390	14.46
		Low Cruise	19	.13	326	14.85
		Idle	32	.18	140	14.79
	No	High Cruise	141	2.69	335	12.16
		Low Cruise	16	.11	303	14.87
		Idle	22	.12	120	14.85
009	Yes	High Cruise	37	.71	400	14.25
		Low Cruise	19	.14	247	14.84
		Idle	58	.18	107	14.76
	No	High Cruise	122	1.75	391	13.12
		Low Cruise	21	.17	254	14.81
		Idle	56	.12	96	14.82
010	Yes	High Cruise	38	.61	488	14.35
		Low Cruise	12	.20	264	14.79
		Idle	25	.18	105	14.80
	No	High Cruise	122	1.54	456	13.32
		Low Cruise	42	.17	301	14.78
		Idle	54	.12	115	14.83
011	Yes	High Cruise	43	.67	486	14.29
		Low Cruise	45	.21	227	14.74
		Idle	67	.18	143	14.75
	No	High Cruise	135	1.80	433	13.06
		Low Cruise	63	.17	295	14.76
		Idle	91	.12	96	14.78
012	Yes	High Cruise	49	.67	512	14.28
		Low Cruise	18	.20	263	14.78
		Idle	42	.18	143	14.77
	No	High Cruise	128	1.52	466	13.35
		Low Cruise	53	.17	357	14.77
		Idle	62	.12	120	14.81

Table 41 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	58	1.35	422	13.59
		Low Cruise	53	0.29	260	14.65
		Idle	137	0.36	144	14.49
	No	High Cruise	84	1.44	506	13.47
		Low Cruise	43	0.29	256	14.67
		Idle	121	0.31	98	14.56

Table 42

Normalized Emission Data
Loaded Mode Tests

Car No. 2

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	19	.07	1268	14.91
		Low Cruise	21	.08	185	14.90
		Idle	24	.09	209	14.89
	No	High Cruise	15	.05	1237	14.93
		Low Cruise	29	.05	169	14.92
		Idle	87	2.65	77	12.26
002	Yes	High Cruise	72	.54	2101	14.38
		Low Cruise	29	.65	409	14.31
		Idle	123	3.11	188	11.76
	No	High Cruise	61	.53	1944	14.40
		Low Cruise	150	.65	617	14.19
		Idle	119	2.77	170	12.11
003	Yes	High Cruise	12	.07	1378	14.92
		Low Cruise	21	.08	248	14.90
		Idle	16	.09	173	14.90
	No	High Cruise	15	.05	1623	14.93
		Low Cruise	16	.06	205	14.93
		Idle	16	.40	112	14.58
004	Yes	High Cruise	24	.13	1045	14.84
		Low Cruise	42	.15	268	14.81
		Idle	54	.17	134	14.77
	No	High Cruise	38	.15	1051	14.81
		Low Cruise	61	.15	205	14.78
		Idle	183	3.27	54	11.53
005	Yes	High Cruise	39	.25	566	14.71
		Low Cruise	160	.07	267	14.75
		Idle	87	.08	134	14.82
	No	High Cruise	113	1.94	234	12.94
		Low Cruise	142	.05	341	14.79
		Idle	221	3.13	36	11.63
006	Yes	High Cruise	31	.14	1262	14.83
		Low Cruise	189	.15	373	14.64
		Idle	81	.18	140	14.74
	No	High Cruise	58	.26	406	14.68
		Low Cruise	112	.10	409	14.78
		Idle	215	3.44	54	11.33

Table 42 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 2

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	62	.59	1841	14.35
		Low Cruise	202	.75	711	14.04
		Idle	125	2.32	132	12.55
	No	High Cruise	57	.63	1730	14.30
		Low Cruise	204	.69	726	14.09
		Idle	145	2.88	128	11.96

Table 43

Normalized Emission Data
Loaded Mode Tests

Car No. 3

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	12	.07	1263	14.92
		Low Cruise	14	.08	194	14.90
		Idle	16	.09	210	14.90
	No	High Cruise	12	.06	1568	14.92
		Low Cruise	12	.06	103	14.92
		Idle	58	1.44	98	13.49
002	Yes	High Cruise	100	.71	2073	14.18
		Low Cruise	179	.71	1375	14.10
		Idle	123	2.54	169	12.33
	No	High Cruise	101	.65	2042	14.24
		Low Cruise	175	.69	461	14.12
		Idle	127	2.54	150	12.32
003	Yes	High Cruise	17	.06	1639	14.92
		Low Cruise	12	.07	164	14.92
		Idle	30	.08	157	14.89
	No	High Cruise	20	.05	1984	14.92
		Low Cruise	15	.05	177	14.93
		Idle	30	.46	109	14.51
004	Yes	High Cruise	38	.12	1563	14.84
		Low Cruise	59	.13	313	14.81
		Idle	56	.15	120	14.79
	No	High Cruise	30	.11	1724	14.86
		Low Cruise	41	.11	291	14.85
		Idle	43	.29	114	14.67
005	Yes	High Cruise	43	.12	1638	14.84
		Low Cruise	90	.13	449	14.77
		Idle	8	.15	59	14.84
	No	High Cruise	24	.16	1940	14.82
		Low Cruise	99	.11	440	14.79
		Idle	61	.39	129	14.55
006	Yes	High Cruise	54	.18	1885	14.76
		Low Cruise	96	.19	827	14.70
		Idle	46	.22	143	14.73
	No	High Cruise	49	.16	2009	14.79
		Low Cruise	136	.21	592	14.65
		Idle	231	2.13	75	12.62

Table 43 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 3

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	117	.70	2153	14.17
		Low Cruise	212	.70	543	14.07
		Idle	138	1.97	176	12.88
	No	High Cruise	121	.75	2067	14.12
		Low Cruise	212	.70	639	14.07
		Idle	138	1.97	156	12.88

Table 44

Normalized Emission Data
Loaded Mode Tests

Car No. 4

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	17	.06	868	14.92
		Low Cruise	18	.07	297	14.91
		Idle	23	.08	232	14.89
	No	High Cruise	14	.05	1716	14.93
		Low Cruise	91	.96	324	13.94
		Idle	14	.05	186	14.93
002	Yes	High Cruise	40	2.12	361	12.83
		Low Cruise	128	1.27	483	13.60
		Idle	56	.26	277	14.68
	No	High Cruise	81	2.83	403	12.08
		Low Cruise	141	1.49	998	13.36
		Idle	59	.27	236	14.66
003	Yes	High Cruise	48	.06	940	14.88
		Low Cruise	40	.07	319	14.89
		Idle	16	.09	251	14.89
	No	High Cruise	38	.10	1447	14.86
		Low Cruise	81	.32	384	14.60
		Idle	10	.05	218	14.94
004	Yes	High Cruise	132	.50	646	14.36
		Low Cruise	107	.20	217	14.68
		Idle	61	.25	163	14.69
	No	High Cruise	178	.52	1377	14.29
		Low Cruise	210	.89	326	13.88
		Idle	77	.31	143	14.61
005	Yes	High Cruise	147	.77	604	14.07
		Low Cruise	147	.42	245	14.42
		Idle	39	.17	168	14.79
	No	High Cruise	212	.38	1603	14.39
		Low Cruise	241	.80	333	13.94
		Idle	73	.43	166	14.50
006	Yes	High Cruise	166	.88	586	13.94
		Low Cruise	154	.34	219	14.49
		Idle	47	.17	168	14.78
	No	High Cruise	227	.47	1434	14.29
		Low Cruise	265	.91	245	13.81
		Idle	102	.32	145	14.57

Table 44 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 4

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	169	1.36	496	13.46
		Low Cruise	139	1.04	621	13.82
		Idle	202	.53	204	14.25
	No	High Cruise	131	.47	1059	14.39
		Low Cruise	184	.97	1148	13.83
		Idle	72	.48	186	14.45

Table 45

Normalized Emission Data
Loaded Mode Tests

Car No. 5

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	22	.06	483	14.92
		Low Cruise	18	.06	236	14.92
		Idle	24	.09	173	14.89
	No	High Cruise	164	1.79	618	13.04
		Low Cruise	153	.82	183	14.01
		Idle	26	.06	112	14.92
002	Yes	High Cruise	118	3.36	582	11.52
		Low Cruise	186	.59	765	14.21
		Idle	288	.27	214	14.42
	No	High Cruise	140	3.22	623	11.63
		Low Cruise	188	1.78	523	13.01
		Idle	400	.30	162	14.27
003	Yes	High Cruise	205	1.14	460	13.64
		Low Cruise	267	.20	241	14.51
		Idle	943	.15	119	13.83
	No	High Cruise	283	1.98	594	12.72
		Low Cruise	286	.72	187	13.98
		Idle	990	.19	100	13.74
004	Yes	High Cruise	247	1.44	357	13.30
		Low Cruise	289	.64	220	14.05
		Idle	545	.22	144	14.19
	No	High Cruise	317	2.23	476	12.43
		Low Cruise	351	1.55	231	13.07
		Idle	598	.22	130	14.14
005	Yes	High Cruise	266	1.55	392	13.17
		Low Cruise	303	.83	221	13.84
		Idle	264	.29	173	14.43
	No	High Cruise	327	2.44	392	12.21
		Low Cruise	360	1.72	176	12.89
		Idle	270	.22	133	14.48
023	Yes	High Cruise	194	.84	460	13.95
		Low Cruise	210	.61	240	14.16
		Idle	290	.41	162	14.28
	No	High Cruise	207	1.40	539	13.37
		Low Cruise	227	1.02	416	13.73
		Idle	314	.34	131	14.32

Table 46

Normalized Emission Data
Loaded Mode Tests

Car No. 6

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	18	.06	736	14.92
		Low Cruise	12	.07	312	14.92
		Idle	14	.08	157	14.91
	No	High Cruise	15	.05	780	14.93
		Low Cruise	10	.06	276	14.93
		Idle	9	.05	104	14.94
002	Yes	High Cruise	29	.13	529	14.84
		Low Cruise	45	.14	252	14.81
		Idle	95	.16	155	14.74
	No	High Cruise	25	.16	582	14.81
		Low Cruise	53	.17	231	14.77
		Idle	151	.44	127	14.40
003	Yes	High Cruise	38	.14	661	14.83
		Low Cruise	42	.07	241	14.88
		Idle	61	.08	131	14.85
	No	High Cruise	32	.11	694	14.85
		Low Cruise	23	.12	244	14.86
		Idle	127	.06	93	14.81
004	Yes	High Cruise	31	.20	676	14.77
		Low Cruise	34	.15	177	14.81
		Idle	71	.17	100	14.75
	No	High Cruise	36	.17	833	14.79
		Low Cruise	33	.18	190	14.79
		Idle	196	.12	69	14.67
005	Yes	High Cruise	24	.20	785	14.78
		Low Cruise	26	.21	286	14.76
		Idle	68	.16	160	14.77
	No	High Cruise	26	.17	834	14.80
		Low Cruise	21	.18	260	14.80
		Idle	54	.12	115	14.83
006	Yes	High Cruise	30	.20	604	14.77
		Low Cruise	33	.14	228	14.82
		Idle	59	.16	94	14.78
	No	High Cruise	31	.17	671	14.80
		Low Cruise	27	.18	190	14.79
		Idle	77	.11	87	14.81

Table 46 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 6

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	37	.20	603	14.76
		Low Cruise	41	.15	233	14.81
		Idle	146	.17	97	14.68
	No	High Cruise	41	.17	764	14.79
		Low Cruise	32	.17	277	14.79
		Idle	78	.11	89	14.80
008	Yes	High Cruise	24	.20	770	14.77
		Low Cruise	34	.15	262	14.82
		Idle	118	.17	133	14.70
	No	High Cruise	37	.17	822	14.79
		Low Cruise	32	.17	277	14.79
		Idle	156	.12	93	14.71
009	Yes	High Cruise	31	.20	628	14.76
		Low Cruise	42	.23	242	14.73
		Idle	78	.17	100	14.75
	No	High Cruise	36	.23	736	14.73
		Low Cruise	27	.18	263	14.79
		Idle	164	.12	91	14.71
004	Yes	High Cruise	39	.21	641	14.75
		Low Cruise	56	.22	242	14.71
		Idle	136	.17	102	14.68
	No	High Cruise	49	.17	780	14.77
		Low Cruise	39	.19	274	14.77
		Idle	191	.12	93	14.68
023	Yes	High Cruise	42	.26	601	14.69
		Low Cruise	75	.37	174	14.55
		Idle	156	.32	126	14.51
	No	High Cruise	40	.27	839	14.68
		Low Cruise	48	.28	227	14.67
		Idle	248	.33	106	14.40

Table 47

Normalized Emission Data
Loaded Mode Tests

Car No. 7

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	14	.05	60	14.94
		Low Cruise	9	.05	224	14.94
		Idle	9	.05	123	14.94
002	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	76	.47	1502	14.45
		Low Cruise	112	.48	1133	14.40
		Idle	69	.37	168	14.55
003	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	80	.53	354	14.39
		Low Cruise	102	.78	220	14.11
		Idle	89	.62	79	14.28
004	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	133	.80	699	14.06
		Low Cruise	142	.90	284	13.95
		Idle	47	.37	60	14.58
005	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	143	.79	674	14.05
		Low Cruise	214	1.00	454	13.77
		Idle	135	1.12	97	13.74
006	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	171	.90	717	13.92
		Low Cruise	211	.85	306	13.93
		Idle	85	.47	60	14.44

Table 47 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 7

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	64	1.18	1798	13.75
		Low Cruise	132	.62	814	14.24
		Idle	85	.47	121	14.44

Table 48

Normalized Emission Data
Loaded Mode Tests

Car No. 8

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	9	.05	245	14.94
		Low Cruise	9	.05	453	14.94
		Idle	9	.05	102	14.94
002	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	62	.77	1320	14.16
		Low Cruise	71	.65	621	14.27
		Idle	62	.65	165	14.28
003	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	106	1.47	197	13.42
		Low Cruise	258	1.98	190	12.74
		Idle	247	6.02	83	8.71
004	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	57	.53	162	14.41
		Low Cruise	71	.42	164	14.51
		Idle	9	.10	102	14.89
005	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	76	.42	183	14.50
		Low Cruise	101	.26	207	14.63
		Idle	18	.10	81	14.88
006	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	98	.62	244	14.27
		Low Cruise	118	.36	139	14.51
		Idle	23	.20	60	14.77

Table 48 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 8

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	106	1.18	343	13.71
		Low Cruise	155	.58	142	14.25
		Idle	29	.26	61	14.71
008	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	114	1.09	140	13.79
		Low Cruise	154	.69	80	14.15
		Idle	47	.37	20	14.58
023	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	245	.89	347	13.85
		Low Cruise	110	.69	468	14.19
		Idle	33	.69	402	14.27

Table 49

Normalized Emission Data
Loaded Mode Tests

Car No. 9

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	14	.10	20	14.88
		Low Cruise	19	.32	20	14.66
		Idle	5	.05	20	14.94
002	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	48	.77	2953	14.18
		Low Cruise	34	.65	931	14.31
		Idle	50	.68	129	14.26
003	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	142	.90	284	13.95
		Low Cruise	102	1.31	199	13.58
		Idle	88	1.01	59	13.89
004	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	143	.47	605	14.38
		Low Cruise	104	.80	375	14.09
		Idle	123	.68	79	14.19
005	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	148	.52	773	14.32
		Low Cruise	114	.74	1121	14.14
		Idle	99	.57	79	14.32
006	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	151	.47	1288	14.36
		Low Cruise	115	.63	424	14.24
		Idle	118	.68	79	14.20

Table 49 (Continued)

Normalized Emission Data
Loaded Mode Tests

Car No. 9

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	163	.46	1509	14.36
		Low Cruise	135	.58	661	14.27
		Idle	81	.26	81	14.66
008	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	172	.31	1344	14.50
		Low Cruise	134	.42	467	14.44
		Idle	104	.20	80	14.69
009	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	167	.15	1708	14.67
		Low Cruise	122	.16	744	14.71
		Idle	64	.11	105	14.83
010	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	170	.32	1368	14.50
		Low Cruise	146	.21	271	14.64
		Idle	59	.11	105	14.83

Table 50

Normalized Emission Data
Loaded Mode Tests

Table 10

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	9	.05	20	14.94
		Low Cruise	14	.15	20	14.83
		Idle	23	.15	20	14.82
002	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	92	.65	3268	14.25
		Low Cruise	70	.88	994	14.04
		Idle	64	.85	125	14.09
003	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	46	.46	647	14.49
		Low Cruise	56	.73	551	14.21
		Idle	9	1.32	263	13.68
004	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	132	.57	417	14.29
		Low Cruise	138	.47	288	14.39
		Idle	66	.80	60	14.13
023	Yes	High Cruise				
		Low Cruise				
		Idle				
	No	High Cruise	108	.90	3119	13.98
		Low Cruise	79	.86	1175	14.06
		Idle	51	.73	119	14.22

Table 41-A

Loaded Mode Test Data

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	9	0.05	333	14.00
		Low Cruise	9	0.05	290	11.85
		Idle	9	0.05	121	8.60
	No	High Cruise	75	4.91	204	12.14
		Low Cruise	14	0.05	355	14.68
		Idle	9	0.05	121	12.43
002	Yes	High Cruise	14	1.30	290	13.04
		Low Cruise	19	0.15	225	11.29
		Idle	61	0.10	80	8.17
	No	High Cruise	80	2.46	400	13.35
		Low Cruise	42	0.15	333	14.00
		Idle	99	0.20	80	11.85
003	Yes	High Cruise	9	0.36	204	13.67
		Low Cruise	5	0.05	247	11.29
		Idle	5	0.05	100	8.17
	No	High Cruise	109	2.39	333	12.73
		Low Cruise	33	0.10	290	13.67
		Idle	37	0.05	100	12.14
004	Yes	High Cruise	18	0.46	307	12.96
		Low Cruise	9	0.10	243	11.28
		Idle	14	0.10	59	8.33
	No	High Cruise	113	2.16	394	13.21
		Low Cruise	28	0.15	307	13.72
		Idle	37	0.10	79	12.47
005	Yes	High Cruise	18	0.62	285	13.21
		Low Cruise	5	0.10	201	11.28
		Idle	9	0.10	79	8.33
	No	High Cruise	113	2.37	372	13.21
		Low Cruise	9	0.20	264	13.21
		Idle Cruise	18	0.10	99	12.22
006	Yes	High Cruise	28	0.79	264	12.96
		Low Cruise	0	0.10	180	11.51
		Idle Cruise	9	0.10	59	8.33
	No	High Cruise	118	2.37	328	13.21
		Low Cruise	9	0.15	222	13.21
		Idle	37	0.10	79	11.99

Table 41-A (Continued)

Loaded Mode Test Data

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	42	0.90	264	12.71
		Low Cruise	9	0.15	180	11.51
		Idle	18	0.10	59	8.33
	No	High Cruise	118	1.63	394	13.46
		Low Cruise	18	0.15	222	13.21
		Idle	51	0.10	79	12.22
008	Yes	High Cruise	23	0.46	350	12.96
		Low Cruise	14	0.10	243	11.05
		Idle	18	0.10	79	8.33
	No	High Cruise	147	2.81	350	12.71
		Low Cruise	14	0.10	264	12.96
		Idle	18	0.10	99	12.22
009	Yes	High Cruise	32	0.62	350	12.47
		Low Cruise	14	0.10	180	10.83
		Idle	32	0.10	59	8.14
	No	High Cruise	123	1.76	394	13.21
		Low Cruise	18	0.15	222	12.96
		Idle	46	0.10	79	12.22
010	Yes	High Cruise	32	0.52	416	12.22
		Low Cruise	9	0.15	201	11.28
		Idle	14	0.10	59	8.33
	No	High Cruise	123	1.56	461	13.46
		Low Cruise	37	0.15	264	12.96
		Idle Cruise	46	0.10	99	12.71
011	Yes	High Cruise	37	0.57	416	12.22
		Low Cruise	32	0.15	160	10.38
		Idle Cruise	37	0.10	79	8.14
	No	High Cruise	137	1.82	438	13.21
		Low Cruise	56	0.15	264	13.21
		Idle	75	0.10	79	12.22
012	Yes	High Cruise	42	0.57	438	12.22
		Low Cruise	14	0.15	201	11.28
		Idle	23	0.10	79	8.14
	No	High Cruise	127	1.50	461	13.21
		Low Cruise	46	0.15	307	12.71
		Idle	51	0.10	99	12.22

Table 41-A (Continued)

Loaded Mode Test Data

Car No. 1

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	51	1.19	372	11.98
		Low Cruise	37	0.20	180	10.16
		Idle	75	0.20	79	7.95
	No	High Cruise	84	1.44	506	13.46
		Low Cruise	37	0.25	222	12.71
		Idle	98	0.25	79	11.75

Table 42-A

Loaded Mode Test Data

Car No. 2

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	14	0.05	937	11.02
		Low Cruise	14	0.05	121	9.75
		Idle	14	0.05	121	8.60
	No	High Cruise	14	0.05	1187	14.33
		Low Cruise	28	0.05	162	14.33
		Idle	90	2.75	80	12.73
002	Yes	High Cruise	70	0.53	2046	14.00
		Low Cruise	28	0.64	400	14.00
		Idle	33	3.37	204	12.73
	No	High Cruise	61	0.53	1934	14.33
		Low Cruise	148	0.64	609	14.00
		Idle	128	2.98	183	13.04
003	Yes	High Cruise	9	0.05	1018	11.02
		Low Cruise	14	0.05	162	9.75
		Idle	9	0.05	100	8.60
	No	High Cruise	14	0.05	1522	14.00
		Low Cruise	14	0.05	182	13.35
		Idle	14	0.36	100	13.04
004	Yes	High Cruise	18	0.10	794	11.28
		Low Cruise	28	0.10	180	9.95
		Idle	32	0.10	79	8.72
	No	High Cruise	37	0.15	1029	14.50
		Low Cruise	60	0.15	201	14.50
		Idle	202	3.61	59	12.71
005	Yes	High Cruise	32	0.20	461	11.98
		Low Cruise	108	0.05	180	9.95
		Idle	51	0.05	79	8.72
	No	High Cruise	118	2.02	243	13.46
		Low Cruise	137	0.05	328	14.24
		Idle	237	3.36	39	12.47
006	Yes	High Cruise	23	0.10	922	10.83
		Low Cruise	123	0.10	243	9.53
		Idle	46	0.10	79	8.33
	No	High Cruise	56	0.25	394	14.24
		Low Cruise	108	0.10	328	14.24
		Idle	237	3.78	59	13.47

Table 42-A (Continued)

Loaded Mode Test Data

Car No. 2

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	60	0.57	1794	13.98
		Low Cruise	197	0.73	695	13.72
		Idle	132	2.44	139	13.21
	No	High Cruise	56	0.62	1691	13.98
		Low Cruise	202	0.68	720	13.98
		Idle	157	3.12	139	12.96

Table 43-A

Loaded Mode Test Data

Car No. 3

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	9	0.05	911	10.76
		Low Cruise	9	0.05	121	9.28
		Idle	9	0.05	121	8.60
	No	High Cruise	9	0.05	1216	11.57
		Low Cruise	9	0.05	80	11.57
		Idle	47	1.18	80	11.02
002	Yes	High Cruise	99	0.70	2046	14.00
		Low Cruise	178	0.70	1365	14.00
		Idle	133	2.75	183	13.35
	No	High Cruise	99	0.64	2008	14.00
		Low Cruise	178	0.70	468	14.33
		Idle	138	2.75	162	13.35
003	Yes	High Cruise	14	0.05	1365	12.43
		Low Cruise	9	0.05	121	11.02
		Idle	19	0.05	100	9.51
	No	High Cruise	19	0.05	1861	14.00
		Low Cruise	14	0.05	162	13.67
		Idle	28	0.42	100	13.35
004	Yes	High Cruise	32	0.10	1313	12.47
		Low Cruise	46	0.10	243	11.51
		Idle	37	0.10	79	9.74
	No	High Cruise	28	0.10	1592	13.72
		Low Cruise	37	0.10	264	13.46
		Idle	37	0.25	99	12.71
005	Yes	High Cruise	37	0.10	1403	12.71
		Low Cruise	70	0.10	350	11.53
		Idle	5	0.10	39	9.74
	No	High Cruise	23	0.15	1864	14.24
		Low Cruise	94	0.10	416	13.98
		Idle	56	0.36	119	13.46
006	Yes	High Cruise	46	0.15	1592	12.47
		Low Cruise	75	0.15	647	11.51
		Idle	32	0.15	99	10.17
	No	High Cruise	46	0.15	1899	13.98
		Low Cruise	132	0.20	576	14.24
		Idle	242	2.23	79	13.21

Table 43-A (Continued)

Loaded Mode Test Data

Car No. 3

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	113	0.68	2084	13.72
		Low Cruise	207	0.68	529	13.72
		Idle	142	2.02	180	13.21
	No	High Cruise	118	0.73	2009	13.72
		Low Cruise	207	0.68	623	13.72
		Idle	142	2.02	160	13.21

Table 44-A

Loaded Mode Test Data

Car No. 4

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	14	0.05	706	12.14
		Low Cruise	14	0.05	225	11.29
		Idle	14	0.05	141	9.05
	No	High Cruise	14	0.05	1687	14.68
		Low Cruise	94	0.99	333	14.33
		Idle	14	0.05	183	14.68
002	Yes	High Cruise	37	1.96	333	11.85
		Low Cruise	94	0.93	355	9.99
		Idle	33	0.15	162	8.60
	No	High Cruise	89	3.13	445	13.35
		Low Cruise	148	1.56	1046	14.00
		Idle	56	0.26	225	14.00
003	Yes	High Cruise	37	0.05	731	11.57
		Low Cruise	28	0.05	225	10.50
		Idle	9	0.05	141	8.38
	No	High Cruise	37	0.10	1396	14.33
		Low Cruise	80	0.31	377	14.33
		Idle	9	0.05	204	14.00
004	Yes	High Cruise	108	0.41	529	11.75
		Low Cruise	79	0.15	160	10.83
		Idle	37	0.15	99	8.92
	No	High Cruise	177	0.52	1373	14.24
		Low Cruise	212	0.90	328	13.98
		Idle	75	0.30	139	14.24
005	Yes	High Cruise	118	0.62	484	11.28
		Low Cruise	108	0.31	180	10.60
		Idle	23	0.10	99	8.72
	No	High Cruise	202	0.36	1528	13.72
		Low Cruise	237	0.79	328	13.72
		Idle	70	0.41	160	13.98
006	Yes	High Cruise	137	0.73	484	11.51
		Low Cruise	113	0.25	160	10.60
		Idle	28	0.10	99	8.72
	No	High Cruise	222	0.46	1403	13.98
		Low Cruise	263	0.90	243	13.72
		Idle	98	0.31	139	13.98

Table 44-A (Continued)

Loaded Mode Test Data

Car No. 4

Test No.	Air	Mode	HC	CO	NOx	CO_2
023	Yes	High Cruise	142	1.14	416	11.28
		Low Cruise	98	0.73	438	9.74
		Idle	118	0.31	119	8.33
	No	High Cruise	127	0.46	1029	13.98
		Low Cruise	182	0.96	1139	13.72
		Idle	70	0.46	180	13.98

Table 45-A

Loaded Mode Test Data

Car No. 5

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	19	0.05	422	13.04
		Low Cruise	14	0.05	183	11.57
		Idle	14	0.05	100	8.60
	No	High Cruise	168	1.83	633	13.35
		Low Cruise	153	0.82	183	14.00
		Idle	23	0.05	100	13.35
002	Yes	High Cruise	119	3.37	585	11.57
		Low Cruise	148	0.47	608	11.29
		Idle	163	0.15	121	8.17
	No	High Cruise	153	3.53	682	12.73
		Low Cruise	193	1.83	537	13.35
		Idle	348	0.26	141	12.43
003	Yes	High Cruise	178	0.99	400	11.85
		Low Cruise	203	0.15	183	11.02
		Idle	633	0.10	80	9.28
	No	High Cruise	290	2.03	609	13.04
		Low Cruise	280	0.70	183	13.67
		Idle	794	0.15	80	11.02
004	Yes	High Cruise	227	1.32	328	12.22
		Low Cruise	237	0.52	180	11.51
		Idle	374	0.15	99	9.74
	No	High Cruise	337	2.37	506	13.21
		Low Cruise	369	1.63	243	13.72
		Idle	548	0.20	119	12.96
005	Yes	High Cruise	237	1.38	350	11.75
		Low Cruise	247	0.68	180	11.28
		Idle	182	0.20	119	9.95
	No	High Cruise	347	2.59	416	12.96
		Low Cruise	369	1.76	180	13.21
		Idle	242	0.20	119	12.96
006	Yes	High Cruise	157	0.68	372	11.28
		Low Cruise	157	0.46	180	10.60
		Idle	177	0.25	99	8.72
	No	High Cruise	212	1.44	553	13.72
		Low Cruise	227	1.02	416	13.72
		Idle	284	0.31	119	12.96

Table 46-A

Loaded Mode Test Data

Car No. 6

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	14	0.05	585	11.85
		Low Cruise	9	0.05	225	10.76
		Idle	9	0.05	100	9.51
	No	High Cruise	14	0.05	731	14.00
		Low Cruise	9	0.05	247	13.35
		Idle	9	0.05	100	14.33
002	Yes	High Cruise	23	0.10	422	11.85
		Low Cruise	33	0.10	183	10.76
		Idle	61	0.10	100	9.51
	No	High Cruise	23	0.15	537	13.67
		Low Cruise	47	0.15	204	13.04
		Idle	143	0.42	121	13.67
003	Yes	High Cruise	28	0.10	491	11.02
		Low Cruise	28	0.05	162	9.99
		Idle	37	0.05	80	9.05
	No	High Cruise	28	0.10	609	13.04
		Low Cruise	19	0.10	204	12.43
		Idle	109	0.05	80	12.73
004	Yes	High Cruise	23	0.15	506	11.05
		Low Cruise	23	0.10	119	9.95
		Idle	42	0.10	59	8.72
	No	High Cruise	32	0.15	744	13.21
		Low Cruise	28	0.15	160	12.47
		Idle	167	0.10	59	12.47
005	Yes	High Cruise	18	0.15	599	11.28
		Low Cruise	18	0.15	201	10.38
		Idle	42	0.10	99	9.12
	No	High Cruise	23	0.15	744	13.21
		Low Cruise	18	0.15	223	12.71
		Idle	46	0.10	99	12.71
006	Yes	High Cruise	23	0.15	461	11.28
		Low Cruise	23	0.10	160	10.38
		Idle	37	0.10	59	9.32
	No	High Cruise	28	0.15	599	13.21
		Low Cruise	23	0.15	160	12.47
		Idle	70	0.10	79	13.46

Table 46-A (Continued)

Loaded Mode Test Data

Car No. 6

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	28	0.15	461	11.28
		Low Cruise	28	0.10	160	10.17
		Idle	89	0.10	59	8.92
	No	High Cruise	37	0.15	695	13.46
		Low Cruise	28	0.15	243	12.96
		Idle	70	0.10	79	13.21
008	Yes	High Cruise	18	0.15	576	11.05
		Low Cruise	23	0.10	180	10.17
		Idle	70	0.10	79	8.72
	No	High Cruise	32	0.15	720	12.96
		Low Cruise	28	0.15	243	12.96
		Idle	132	0.10	79	12.47
009	Yes	High Cruise	32	0.20	647	12.96
		Low Cruise	23	0.15	222	12.47
		Idle	142	0.10	79	12.71
	No	High Cruise	28	0.15	461	10.60
		Low Cruise	37	0.15	160	9.74
		Idle	79	0.10	59	8.52
021	Yes	High Cruise	42	0.15	671	12.71
		Low Cruise	32	0.15	222	11.99
		Idle	162	0.10	79	12.47
	No	High Cruise	32	0.20	461	11.28
		Low Cruise	51	0.25	119	9.95
		Idle	98	0.20	79	9.12
023	Yes	High Cruise	37	0.25	769	13.46
		Low Cruise	42	0.25	201	12.96
		Idle	48	0.31	99	13.46

Table 47-A

Loaded Mode Test Data

Car No. 7

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	14	0.05	60	15.03
		Low Cruise	9	0.05	225	15.03
		Idle	9	0.05	121	14.68
002	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	75	0.47	1490	14.33
		Low Cruise	109	0.47	1102	14.00
		Idle	66	0.36	162	14.00
003	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	79	0.52	350	14.24
		Low Cruise	103	0.79	222	14.24
		Idle	89	0.62	79	14.24
004	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	132	0.79	695	13.98
		Low Cruise	142	0.90	285	13.98
		Idle	46	0.36	59	14.24
005	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	142	0.79	671	13.98
		Low Cruise	217	1.02	461	13.98
		Idle	137	1.14	99	13.98
006	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	172	0.90	720	13.98
		Low Cruise	212	0.85	307	13.98
		Idle	84	0.46	59	14.24

Table 48-A

Loaded Mode Test Data

Car No. 8

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	9	0.05	247	15.03
		Low Cruise	9	0.05	445	14.68
		Idle	9	0.05	100	14.68
002	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	61	0.76	1305	14.00
		Low Cruise	70	0.64	607	14.00
		Idle	61	0.64	162	14.00
003	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	108	1.50	201	13.72
		Low Cruise	273	2.09	201	13.46
		Idle	294	7.18	99	10.38
004	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	56	0.52	160	14.24
		Low Cruise	70	0.41	160	14.24
		Idle	9	0.10	99	14.50
005	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	75	0.41	180	14.24
		Low Cruise	98	0.25	201	14.24
		Idle	18	0.10	79	14.50
006	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	98	0.62	243	14.24
		Low Cruise	118	0.36	139	14.50
		Idle	23	0.20	59	14.50

Table 48-A (Continued)

Loaded Mode Test Data

Car No. 8

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	108	1.20	350	13.98
		Low Cruise	152	0.57	139	13.98
		Idle	28	0.25	59	14.24
008	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	113	1.08	139	13.72
		Low Cruise	152	0.68	79	13.98
		Idle	46	0.36	20	14.24
023	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	247	0.90	350	13.98
		Low Cruise	108	0.68	461	13.98
		Idle	32	0.68	394	13.98

Table 49-A

Loaded Mode Test Data

Car No. 9

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	14	0.10	20	14.68
		Low Cruise	19	0.31	20	14.33
		Idle	5	0.05	20	14.68
002	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	47	0.76	2916	14.00
		Low Cruise	33	0.64	911	14.00
		Idle	47	0.64	121	13.35
003	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	142	0.90	285	13.98
		Low Cruise	103	1.32	201	13.72
		Idle	89	1.02	59	13.98
004	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	142	0.46	599	14.24
		Low Cruise	103	0.79	372	13.98
		Idle	123	0.68	79	14.24
005	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	147	0.52	769	14.24
		Low Cruise	113	0.73	416	13.98
		Idle	98	0.57	79	14.24
006	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	147	0.46	1254	13.98
		Low Cruise	113	0.62	416	13.98
		Idle	118	0.68	79	14.24

Table 49-A (Continued)

Loaded Mode Test Data

Car No. 9

Test No.	Air	Mode	HC	CO	NOx	CO_2
007	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	162	0.46	1496	14.24
		Low Cruise	132	0.57	647	13.98
		Idle	79	0.25	79	14.24
008	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	172	0.31	1343	14.50
		Low Cruise	132	0.41	461	14.24
		Idle	103	0.20	78	14.50
009	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	162	0.15	1658	14.24
		Low Cruise	118	0.15	720	14.24
		Idle	60	0.10	99	13.98
010	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	167	0.31	1343	14.24
		Low Cruise	142	0.20	264	14.24
		Idle	56	0.10	99	13.98

Table 50-A

Loaded Mode Test Data

Car No. 10

Test No.	Air	Mode	HC	CO	NOx	CO_2
001	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	9	0.05	20	14.68
		Low Cruise	14	0.15	20	14.68
		Idle	23	0.15	20	14.68
002	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	90	0.64	3211	14.00
		Low Cruise	70	0.88	991	14.00
		Idle	61	0.82	121	13.67
003	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	46	0.46	647	14.50
		Low Cruise	56	0.73	552	14.24
		Idle	9	1.32	264	13.72
004	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	132	0.57	416	14.24
		Low Cruise	137	0.46	285	14.24
		Idle	65	0.79	59	13.98
023	Yes	High Cruise	0			
		Low Cruise				
		Idle				
	No	High Cruise	108	0.90	3118	13.98
		Low Cruise	79	0.85	1168	13.98
		Idle	51	0.73	119	14.24

Tables 51 - 60

Federal Two-Speed Test Data

Tables 51-60 list the normalized emission data, the exhaust pipe skin temperatures, and the calculated catalyst efficiency values. Tables 51A-60A list the "as measured" raw emission data. The units for the reported values are:

HC	in ppm
CO	in %
NOx	in ppm
CO_2	in %
Temperature	in °F
Efficiency	in %

Table 51

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 1

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	560	28	0.38	146	14.59
		After	571	13	0.07	210	14.91
		Eff.		51.6	80.4	0	-
	Idle	Before	505	118	0.27	72	14.60
		After	517	107	0.09	107	14.88
		Eff.		78.9	66.9	0	-
002	2500 rpm	Before	636	36	0.23	155	14.73
		After	565	36	0.23	187	14.73
		Eff.		0	0	0	-
	Idle	Before	555	199	0.27	73	14.51
		After	520	224	0.27	109	14.49
		Eff.		0	0.2	0	-
003	2500 rpm	Before	645	43	0.23	155	14.72
		After	693	22	0.08	190	14.90
		Eff.		49.4	66.3	0	-
	Idle	Before	567	224	0.27	109	14.49
		After	603	101	0.09	109	14.80
		Eff.		54.7	66.8	0.5	-
004	2500 rpm	Before	637	36	0.31	156	14.65
		After	567	22	0.16	216	14.82
		Eff.		39.8	50.5	0	-
	Idle	Before	547	205	0.36	107	14.42
		After	531	135	0.18	70	14.67
		Eff.		34.0	50.3	34.3	-
005	2500 rpm	Before	680	97	0.41	96	14.49
		After	612	76	0.17	164	14.75
		Eff.		21.9	59.3	0	-
	Idle	Before	589	292	0.36	70	14.32
		After	575	141	0.36	69	14.49
		Eff.		51.8	1.2	1.2	-

Table 51 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 1

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	690	124	0.41	131	14.45
		After	635	76	0.25	163	14.67
		Eff.		39.1	40.5	0	-
	Idle	Before	575	274	0.36	106	14.34
		After	585	160	0.18	142	14.65
		Eff.		41.6	50.1	0	-
007	2500 rpm	Before	755	122	0.41	96	14.46
		After	650	74	0.24	127	14.68
		Eff.		39.1	40.4	0	-
	Idle	Before	600	218	0.35	104	14.41
		After	615	97	0.17	102	14.72
		Eff.		55.6	51.2	2.4	-
008	2500 rpm	Before	722	127	0.42	134	14.44
		After	603	70	0.17	197	14.76
		Eff.		95.3	60.9	0	-
	Idle	Before	601	237	0.28	110	14.46
		After	573	112	0.09	110	14.79
		Eff.		52.9	66.7	0.2	-
009	2500 rpm	Before	740	434	0.52	99	14.01
		After	620	293	0.25	164	14.44
		Eff.		32.5	52.4	0	-
	Idle	Before	600	242	0.35	104	14.39
		After	600	127	0.18	106	14.68
		Eff.		47.9	49.0	0	-
010	2500 rpm	Before	660	214	0.42	99	14.35
		After	590	281	0.34	133	14.36
		Eff.		0	19.9	0	-
	Idle	Before	580	196	0.36	71	14.43
		After	560	117	0.18	107	14.69
		Eff.		40.1	50.26	0	-

Table 51 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 1

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
011	2500 rpm	Before	625	68	0.41	129	14.52
		After	591	99	0.25	163	14.65
		Eff.		0	39.5	0	-
	Idle	Before	608	230	0.36	107	14.39
		After	574	198	0.18	108	14.60
		Eff.		13.7	49.3	0	-
012	2500 rpm	Before	785	460	0.53	101	13.97
		After	650	197	0.25	165	14.54
650	74	Eff.		57.2	53.0	0	-
	Idle	Before	640	223	0.36	107	14.40
		After	625	126	0.18	106	14.68
		Eff.		43.3	50.2	0.4	-
023	2500 rpm	Before	600	97	0.41	63	14.49
		After	570	150	0.51	66	14.33
		Eff.		0	0	0	-
	Idle	Before	500	223	0.36	34	14.40
		After	505	263	0.37	72	14.35
		Eff.		0	0	0	-

Table 52

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 2

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	605	69	1.24	170	13.69
		After	531	35	.09	182	14.87
		Eff.		50.1	92.7	0	-
	Idle	Before	565	95	2.71	175	12.19
		After	510	41	0.09	215	14.87
		Eff.		57.0	96.7	0	-
002	2500 rpm	Before	623	61	1.19	163	13.75
		After	526	61	1.19	163	13.75
		Eff.		0	0	0	-
	Idle	Before	503	100	2.66	148	12.23
		After	410	98	2.37	152	12.52
		Eff.		2.4	10.7	0	-
003	2500 rpm	Before	623	100	1.38	150	13.51
		After	499	35	0.09	146	14.87
		Eff.		65.3	93.4	2.7	-
	Idle	Before	558	95	2.42	134	12.48
		After	489	51	0.09	145	14.85
		Eff.		46.3	96.2	0	-
004	2500 rpm	Before	655	117	1.43	123	13.44
		After	489	57	0.18	140	14.76
		Eff.		51.6	87.6	0	-
	Idle	Before	600	203	3.61	109	11.17
		After	515	112	0.17	136	14.71
		Eff.		44.7	95.2	0	-
005	2500 rpm	Before	560	146	1.74	123	13.10
		After	480	99	0.18	140	14.72
		Eff.		32.4	98.9	0	-
	Idle	Before	485	206	3.43	111	11.35
		After	485	156	0.26	138	14.57
		Eff.		24.5	92.4	0	-

Table 52 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 2

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	570	175	1.77	104	13.04
		After	450	139	0.09	110	14.76
		Eff.		20.3	94.8	0	-
	Idle	Before	515	223	3.49	110	11.27
		After	505	184	0.27	105	14.53
		Eff.		17.6	92.3	4.0	-
023	2500 rpm	Before	603	101	1.30	143	13.59
		After	476	106	1.05	164	13.84
		Eff.		0	19.1	0	-
	Idle	Before	522	129	2.44	131	12.42
		After	422	130	2.32	132	12.54
		Eff.		0	4.9	0	-

Table 53

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 3

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	565	59	0.81	127	14.12
		After	490	17	0.09	187	14.89
		Eff.		71.6	88.5	0	-
	Idle	Before	505	108	2.53	154	12.36
		After	441	40	0.09	138	14.87
		Eff.		63.3	96.6	10.4	-
002	2500 rpm	Before	640	88	0.81	201	14.10
		After	513	84	0.81	201	14.10
		Eff.		4.5	0	0	-
	Idle	Before	550	115	2.55	146	12.32
		After	435	118	2.54	130	12.33
		Eff.		0	0.4	10.8	-
003	2500 rpm	Before	530	160	1.10	184	13.73
		After	417	42	0.15	88	14.81
		Eff.		74.0	86.5	52.2	-
	Idle	Before	492	229	3.90	126	10.85
		After	430	137	0.15	122	14.70
		Eff.		40.1	96.1	3.2	-
004	2500 rpm	Before	610	134	1.41	515	13.45
		After	480	71	0.15	248	14.77
		Eff.		47.0	89.0	51.9	-
	Idle	Before	530	194	2.14	133	12.65
		After	460	132	0.16	93	14.70
		Eff.		31.5	92.6	30.1	-
005	2500 rpm	Before	630	141	1.05	614	13.80
		After	464	91	0.15	400	14.75
		Eff.		35.3	85.5	34.9	-
	Idle	Before	539	178	1.65	136	13.16
		After	431	111	0.16	93	14.72
		Eff.		37.8	90.4	31.4	-

Table 53 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 3

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	570	160	1.10	611	13.73
		After	475	127	0.15	430	14.71
		Eff.		20.8	86.3	86.3	-
	Idle	Before	475	261	3.48	128	11.24
		After	445	186	0.22	116	14.58
		Eff.		28.8	93.7	9.5	-
023	2500 rpm	Before	570	135	0.87	184	13.99
		After	415	115	0.97	204	13.90
		Eff.		14.9	0	0	-
	Idle	Before	510	128	1.58	155	13.28
		After	395	122	1.30	158	13.56
		Eff.		4.9	17.3	0	-

Table 54

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 4

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	700	101	0.69	233	14.20
		After	623	30	0.08	226	14.89
		Eff.		69.7	88.4	2.8	-
	Idle	Before	536	69	0.43	232	14.50
		After	572	24	0.08	238	14.89
		Eff.		65.8	80.3	0	-
002	2500 rpm	Before	700	134	0.44	272	14.42
		After	575	126	0.44	272	14.43
		Eff.		6.2	0	0	-
	Idle	Before	593	97	0.35	245	14.55
		After	500	89	0.26	246	14.64
		Eff.		8.3	24.5	0	-
003	2500 rpm	Before	643	106	0.26	246	14.62
		After	561	64	0.09	243	14.84
		Eff.		40.0	67.0	1.1	-
	Idle	Before	557	60	0.18	219	14.76
		After	536	35	0.09	220	14.87
		Eff.		42.0	49.6	0	-
004	2500 rpm	Before	690	190	0.50	166	14.29
		After	550	149	0.25	199	14.59
		Eff.		21.5	50.1	0	-
	Idle	Before	580	119	0.70	134	14.17
		After	530	86	0.17	134	14.74
		Eff.		27.6	75.8	0.7	-
005	2500 rpm	Before	665	189	0.52	166	14.28
		After	543	141	0.25	199	14.60
		Eff.		25.7	51.7	0	0
	Idle	Before	594	111	0.62	135	14.26
		After	544	88	0.26	136	14.65
		Eff.		21.2	58.2	0	-

Table 54 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 4

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	655	216	0.61	202	14.16
		After	480	177	0.51	228	14.30
		Eff.		17.9	16.9	0	-
	Idle	Before	570	126	0.52	167	14.34
		After	560	112	0.26	170	14.62
		Eff.		11.6	50.7	0	-
023	2500 rpm	Before	640	123	0.51	196	14.36
		After	500	123	0.59	195	14.28
		Eff.		0.6	0	0.6	-
	Idle	Before	515	80	0.43	172	14.48
		After	430	80	0.35	173	14.56
		Eff.		0	19.5	0	-

Table 55

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 5

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	790	109	0.57	165	14.31
		After	590	31	0.07	219	14.90
		Eff.		71.5	88.1	0	-
	Idle	Before	600	383	0.31	154	14.28
		After	543	46	0.07	167	14.88
		Eff.		88.1	77.5	0	-
002	2500 rpm	Before	708	119	0.48	162	14.39
		After	493	100	0.48	162	14.41
		Eff.		15.6	0	0	-
	Idle	Before	490	957	0.26	158	13.71
		After	390	984	0.25	154	13.68
		Eff.		0	2.6	2.6	-
003	2500 rpm	Before	645	131	0.69	106	14.16
		After	370	101	0.62	133	14.27
		Eff.		22.9	10.9	0	-
	Idle	Before	530	1407	0.35	35	13.13
		After	430	1356	0.21	55	13.33
		Eff.		3.6	39.5	0	-
004	2500 rpm	Before	640	182	0.69	105	14.11
		After	370	158	0.62	160	14.21
		Eff.		13.3	10.9	0	-
	Idle	Before	530	1075	0.39	122	13.45
		After	430	940	0.27	107	13.72
		Eff.		12.6	30.1	12.6	-
005	2500 rpm	Before	650	179	0.77	134	14.04
		After	380	167	0.71	162	14.11
		Eff.		6.3	8.28	0	-
	Idle	Before	500	765	0.35	137	13.83
		After	430	940	0.34	136	13.64
		Eff.		0	1.3	1.3	-
023	2500 rpm	Before	694	132	0.62	133	14.24
		After	463	132	0.62	133	14.24
		Eff.		0	0	0	-
	Idle	Before	574	426	0.31	123	14.23
		After	435	388	0.34	106	14.24
		Eff.		8.8	0	13.9	-

Table 56

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 6

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	720	44	0.24	95	14.71
		After	660	14	0.08	161	14.90
		Eff.		67.4	66.2	0	-
	Idle	Before	605	307	0.25	98	14.42
		After	620	31	0.08	132	14.88
		Eff.		89.8	66.5	0	-
002	2500 rpm	Before	730	73	0.23	187	14.69
		After	749	73	0.23	187	14.69
		Eff.		0	0	0	-
	Idle	Before	585	243	0.25	164	14.49
		After	655	275	0.25	164	14.46
		Eff.		0	0.24	.24	-
003	2500 rpm	Before	750	101	.25	100	14.64
		After	620	61	.08	131	14.85
		Eff.		40	67.1	0	-
	Idle	Before	530	500	.25	102	14.21
		After	595	250	.09	105	14.64
		Eff.		50	65.6	0	-
004	2500 rpm	Before	773	89	.40	126	14.51
		After	584	74	.24	159	14.68
		Eff.		16.9	39.3	0	-
	Idle	Before	644	509	.35	68	14.10
		After	630	293	.17	66	14.51
		Eff.		42.5	50.8	1.7	-
005	2500 rpm	Before	650	100	.33	99	14.56
		After	610	76	.25	163	14.67
		Eff.		24.5	26.1	0	-
	Idle	Before	515	480	.33	98	14.15
		After	567	351	.17	100	14.45
		Eff.		26.9	48.9	0	-
006	2500 rpm	Before	702	92	.33	96	14.57
		After	594	84	.17	164	14.74
		Eff.		7.9	47.4	0	-
	Idle	Before	533	71	.25	99	14.67
		After	574	39	.17	100	14.77
		Eff.		44.8	32.8	0	-

Table 56 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 6

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
007	2500 rpm	Before	646	102	.31	92	14.58
		After	634	74	.24	159	14.68
		Eff.		27.2	22.8	0	-
	Idle	Before	572	472	.34	66	14.15
		After	593	612	.34	66	14.00
		Eff.		0	1.0	1.0	-
008	2500 rpm	Before	760	204	.33	98	14.45
		After	688	107	.17	130	14.72
		Eff.		47.4	50.2	0	-
	Idle	Before	508	562	.25	34	14.14
		After	613	337	.09	67	14.55
		Eff.		40.1	66.5	0	-
009	2500 rpm	Before	678	147	.41	98	14.43
		After	605	149	.25	166	14.59
		Eff.		0	39.3	0	-
	Idle	Before	561	660	0.34	67	13.95
		After	583	391	.17	67	14.40
		Eff.		40.8	49.5	0	-
010	2500 rpm	Before	670	191	0.42	100	14.37
		After	590	210	0.26	169	14.52
		Eff.		0	39.4	0	-
	Idle	Before	565	642	0.34	101	13.96
		After	570	512	0.17	101	14.28
		Eff.		20.1	50.1	0.1	-
023	2500 rpm	Before	650	111	0.40	62	14.48
		After	615	149	0.40	62	14.44
		Eff.		0	0.3	0.3	-
	Idle	Before	570	269	0.32	63	14.39
		After	575	372	0.33	64	14.27
		Eff.		0	0	0	-

Table 57

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 7

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	719	33	0.59	248	14.37
		After	642	9	0.05	61	14.94
		Eff.		72.3	91.4	75.4	-
	Idle	Before	560	76	0.37	165	14.55
		After	558	14	0.05	61	14.93
		Eff.		81.3	86.1	62.9	-
002	2500 rpm	Before	520	38	0.55	299	14.41
		After	500	34	0.55	299	14.42
		Eff.		10.8	0	0	-
	Idle	Before	484	78	0.37	168	14.54
		After	480	74	0.38	150	14.54
		Eff.		4.5	0	10.9	-
003	2500 rpm	Before	570	76	1.03	225	13.89
		After	492	46	0.73	79	14.22
		Eff.		39.5	29.4	64.9	-
	Idle	Before	510	133	0.74	120	14.12
		After	582	52	0.30	39	14.64
		Eff.		61.4	58.9	67.2	-
004	2500 rpm	Before	494	81	0.92	248	13.99
		After	416	56	0.79	118	14.15
		Eff.		30.9	14.5	52.3	-
	Idle	Before	462	120	0.63	142	14.24
		After	406	56	0.31	60	14.63
		Eff.		53.0	50.5	58.0	-
005	2500 rpm	Before	550	98	0.96	160	13.94
		After	500	69	0.89	78	14.04
		Eff.		29.4	7.3	51.2	-
	Idle	Before	525	138	0.74	100	14.11
		After	485	66	0.31	39	14.62
		Eff.		52.6	57.6	60.7	-

Table 57 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 7

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	504	105	0.92	205	13.97
		After	458	79	0.90	99	14.01
		Eff.		24.5	1.6	51.5	-
	Idle	Before	483	134	0.69	121	14.17
		After	453	77	0.32	40	14.60
		Eff.		42.5	53.9	66.3	-
023	2500 rpm	Before	467	51	0.62	244	14.32
		After	458	46	0.62	266	14.33
		Eff.		9.8	0	0	-
	Idle	Before	440	104	0.47	121	14.42
		After	431	99	0.47	121	14.43
		Eff.		4.8	0	0	-

Table 58

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 8

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	350	38	0.73	258	14.23
		After	422	14	0.05	102	14.93
		Eff.		62.3	93.1	60.5	-
	Idle	Before	392	64	0.64	136	14.29
		After	453	14	0.05	81	14.93
		Eff.		77.7	92.1	40.2	-
002	2500 rpm	Before	380	43	0.71	295	14.24
		After	385	48	0.77	294	14.18
		Eff.		0	0	0.4	-
	Idle	Before	429	76	0.65	165	14.27
		After	408	81	0.65	186	14.26
		Eff.		0	0	0	-
003	2500 rpm	Before	328	86	1.89	174	13.02
		After	329	81	1.63	76	13.27
		Eff.		0	13.4	56.1	-
	Idle	Before	377	241	6.09	83	8.65
		After	362	264	6.02	83	8.70
		Eff.		0	1.1	0	-
004	2500 rpm	Before	337	102	0.83	254	14.06
		After	384	43	0.21	103	14.75
		Eff.		57.5	74.9	59.6	-
	Idle	Before	604	141	1.19	138	13.65
		After	609	29	0.32	81	14.65
		Eff.		79.6	73.3	41.2	-
005	2500 rpm	Before	350	63	0.83	255	14.10
		After	380	48	0.16	124	14.79
		Eff.		24.0	81.2	51.5	-
	Idle	Before	395	106	0.70	144	14.18
		After	400	33	0.10	81	14.86
		Eff.		69.2	85.4	43.6	-

Table 58 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 8

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	405	153	0.82	232	14.01
		After	428	57	0.15	101	14.79
		Eff.		62.7	81.4	56.5	-
	Idle	Before	452	122	0.64	123	14.23
		After	443	29	0.10	103	14.86
		Eff.		76.1	83.8	16.2	-
007	2500 rpm	Before	415	89	0.84	281	14.06
		After	470	38	0.16	124	14.80
		Eff.		57.0	81.5	56.0	-
	Idle	Before	455	109	0.66	147	14.23
		After	485	24	0.10	103	14.87
		Eff.		77.9	84.1	29.6	-
008	2500 rpm	Before	328	136	0.67	239	14.19
		After	358	78	0.16	123	14.76
		Eff.		43.0	76.7	48.5	-
	Idle	Before	398	99	0.48	125	14.41
		After	390	39	0.10	103	14.85
		Eff.		60.9	78.4	17.4	-
023	2500 rpm	Before	403	61	0.80	224	14.14
		After	394	57	0.80	225	14.14
		Eff.		6.6	0	0	-
	Idle	Before	444	99	0.80	120	14.10
		After	416	103	0.85	119	14.04
		Eff.		0	0	0.4	-

Table 59

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 9

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	520	28	0.77	207	14.20
		After	400	9	0.10	20	14.89
		Eff.		67.9	86.8	90.2	-
	Idle	Before	498	108	0.73	83	14.16
		After	440	15	0.05	63	14.93
		Eff.		86.5	92.8	24.6	-
002	2500 rpm	Before	536	14	0.75	203	14.23
		After	384	14	0.77	228	14.21
		Eff.		0	0	0	-
	Idle	Before	481	63	0.73	126	14.20
		After	380	65	0.68	151	14.25
		Eff.		0	6.1	0	-
003	2500 rpm	Before	564	59	1.42	239	13.52
		After	340	59	1.23	58	13.70
		Eff.		0.5	13.0	75.9	-
	Idle	Before	496	112	1.31	158	13.57
		After	420	107	1.01	59	13.87
		Eff.		4.1	22.5	63.0	-
004	2500 rpm	Before	526	42	1.02	200	13.94
		After	359	32	0.58	80	14.39
		Eff.		22.8	43.4	60.2	-
	Idle	Before	511	124	1.08	99	13.78
		After	427	123	0.62	59	14.25
		Eff.		0.4	42.8	40.6	-
005	2500 rpm	Before	600	28	0.86	182	14.11
		After	392	37	0.96	139	14.00
		Eff.		0	0	23.4	-
	Idle	Before	518	99	1.09	100	13.81
		After	455	95	0.57	59	14.32
		Eff.		4.1	47.2	40.4	-

Table 59 (Continued)

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 9

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
006	2500 rpm	Before	630	47	0.87	292	14.08
		After	400	47	0.54	186	14.41
		Eff.		0	38.5	36.5	-
	Idle	Before	520	110	0.87	101	14.01
		After	465	106	0.26	61	14.63
		Eff.		4.1	70.4	40.1	-
007	2500 rpm	Before	475	33	0.74	183	14.22
		After	340	24	0.32	81	14.66
		Eff.		27.3	57.0	55.6	-
	Idle	Before	455	105	0.87	122	14.02
		After	375	97	0.21	61	14.69
		Eff.		7.9	76.2	49.9	-
008	2500 rpm	Before	530	32	0.80	182	14.17
		After	365	29	0.26	82	14.71
		Eff.		10.8	67.7	55.3	-
	Idle	Before	500	94	1.14	99	13.76
		After	420	100	0.10	60	14.79
		Eff.		0	91.1	39.4	-
009	2500 rpm	Before	570	33	0.83	211	14.13
		After	380	33	0.16	166	14.81
		Eff.		1.0	81.2	21.2	-
	Idle	Before	490	80	0.78	106	14.13
		After	430	81	0.16	106	14.75
		Eff.		0	79.3	0	-
010	2500 rpm	Before	565	44	0.83	233	14.12
		After	430	33	0.10	145	14.86
		Eff.		24.2	87.4	37.7	-
	Idle	Before	520	89	0.90	84	14.00
		After	455	91	0.11	85	14.79
		Eff.		0	88.0	0	-

Table 60

Normalized Emission Data
Federal Two-Speed Idle Tests

Car No. 10

Test No.	Speed	Catalyst	Temperature °F	HC	CO	NOx	CO_2
001	2500 rpm	Before	508	34	0.71	208	14.25
		After	374	5	0.05	20	14.94
		Eff.		84.9	92.9	90.2	-
	Idle	Before	493	68	0.90	103	14.02
		After	425	14	0.05	41	14.93
		Eff.		79.0	94.4	60.3	-
002	2500 rpm	Before	615	33	0.65	333	14.32
		After	440	33	0.59	334	14.37
		Eff.		0	7.5	0	-
	Idle	Before	590	70	0.88	121	14.04
		After	469	82	0.84	145	14.07
		Eff.		0	4.4	0	-
003	2500 rpm	Before	510	60	1.19	201	13.74
		After	325	56	0.90	59	14.04
		Eff.		6.5	24.2	70.6	-
	Idle	Before	400	69	1.73	97	13.20
		After	370	69	1.36	58	13.56
		Eff.		0	21.0	39.9	-
004	2500 rpm	Before	500	61	1.03	225	13.90
		After	380	60	0.62	100	14.31
		Eff.		0.8	39.7	55.8	-
	Idle	Before	480	70	1.20	79	13.72
		After	400	75	0.86	59	14.06
		Eff.		0	28.8	24.9	-
023	2500 rpm	Before	470	28	0.73	222	14.24
		After	320	28	0.73	222	14.24
		Eff.		0	0	0	-
	Idle	Before	460	55	0.84	98	14.10
		After	355	65	0.78	98	14.15
		Eff.		0	6.8	0	-

Table 51-A

Federal Two-Speed Idle Test Data

Car No. 1

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	19	0.26	100	9.99
		After	9	0.05	141	9.99
	Idle	Before	66	0.15	40	8.17
		After	14	0.05	60	8.38
002	2500 rpm	Before	23	0.15	100	9.51
		After	23	0.15	121	9.51
	Idle	Before	109	0.15	40	7.96
		After	123	0.15	60	7.96
003	2500 rpm	Before	28	0.15	100	9.51
		After	14	0.05	121	9.51
	Idle	Before	123	0.15	60	7.96
		After	56	0.05	60	8.17
004	2500 rpm	Before	23	0.20	99	9.32
		After	14	0.10	139	9.53
	Idle	Before	113	0.20	59	7.95
		After	75	0.10	39	8.14
005	2500 rpm	Before	60	0.25	59	8.92
		After	46	0.10	99	8.92
	Idle	Before	162	0.20	39	7.95
		After	79	0.20	39	8.14
006	2500 rpm	Before	75	0.25	79	8.72
		After	46	0.15	99	8.92
	Idle	Before	152	0.20	59	7.95
		After	89	0.10	79	8.14
007	2500 rpm	Before	75	0.25	59	8.92
		After	46	0.15	79	9.12
	Idle	Before	123	0.20	59	8.14
		After	56	0.10	59	8.52

Table 51-A (Continued)

Federal Two-Speed Idle Test Data

Car No. 1

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
008	2500 rpm	Before	75	0.25	79	8.52
		After	42	0.10	119	8.92
	Idle	Before	127	0.15	59	7.76
		After	60	0.05	59	7.95
009	2500 rpm	Before	258	0.31	59	8.33
		After	177	0.15	99	8.72
	Idle	Before	137	0.20	59	8.14
		After	70	0.10	59	8.14
010	2500 rpm	Before	127	0.25	59	8.52
		After	167	0.20	79	8.52
	Idle	Before	108	0.20	39	7.95
		After	65	0.10	59	8.14
011	2500 rpm	Before	42	0.25	79	8.92
		After	60	0.15	99	8.92
	Idle	Before	127	0.20	59	7.95
		After	108	0.10	59	7.95
012	2500 rpm	Before	268	0.31	59	8.14
		After	118	0.15	99	8.72
	Idle	Before	123	0.20	59	7.95
		After	70	0.10	59	8.14
023	2500 rpm	Before	60	0.25	39	8.92
		After	89	0.30	39	8.52
	Idle	Before				
		After				

Table 52-A

Federal Two-Speed Idle Test Data

Car No. 2

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	66	1.18	162	13.04
		After	19	0.05	100	8.17
	Idle	Before	99	2.83	183	12.73
		After	23	0.50	121	8.38
002	2500 rpm	Before	61	1.18	162	13.67
		After	61	1.18	162	13.67
	Idle	Before	109	2.90	162	13.35
		After	104	2.53	162	13.35
003	2500 rpm	Before	94	1.30	141	12.73
		After	19	0.05	80	8.17
	Idle	Before	99	2.53	141	13.04
		After	28	0.50	80	8.17
004	2500 rpm	Before	113	1.38	119	12.96
		After	32	0.10	79	8.33
	Idle	Before	222	3.95	119	12.22
		After	65	0.10	79	8.52
005	2500 rpm	Before	142	1.69	119	12.71
		After	56	0.10	79	8.33
	Idle	Before	222	3.69	119	12.22
		After	89	0.15	79	8.33
006	2500 rpm	Before	167	1.69	99	12.47
		After	75	0.05	59	7.95
	Idle	Before	242	3.78	119	12.22
		After	103	0.15	59	8.14
023	2500 rpm	Before	98	1.26	139	13.21
		After	103	1.02	160	13.46
	Idle	Before	137	2.59	139	13.21
		After	137	2.44	139	13.21

Table 53-A

Federal Two-Speed Idle Test Data

Car No. 3

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	51	0.70	609	12.14
		After	9	0.05	100	7.96
	Idle	Before	99	2.31	141	11.29
		After	23	0.05	80	8.60
002	2500 rpm	Before	89	0.82	204	14.33
		After	85	0.82	204	14.33
	Idle	Before	128	2.83	162	13.67
		After	128	2.75	141	13.35
003	2500 rpm	Before	89	0.82	204	14.33
		After	85	0.82	204	14.33
	Idle	Before	128	2.83	162	13.67
		After	128	2.75	141	13.35
004	2500 rpm	Before	132	1.38	506	13.21
		After	46	0.10	160	9.53
	Idle	Before	202	2.23	139	13.21
		After	84	0.10	59	9.32
005	2500 rpm	Before	137	1.02	599	13.46
		After	60	0.10	264	9.74
	Idle	Before	182	1.69	139	13.46
		After	70	0.10	59	9.32
006	2500 rpm	Before	157	1.08	599	13.46
		After	84	0.10	285	9.74
	Idle	Before	284	3.78	139	12.22
		After	127	0.15	79	9.95
023	2500 rpm	Before	132	0.85	185	13.72
		After	113	0.96	201	13.72
	Idle	Before	132	1.63	160	13.72
		After	123	1.32	160	13.72

Table 54-A

Federal Two-Speed Idle Test Data

Car No. 4

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	61	0.42	141	8.60
		After	19	0.05	141	9.28
	Idle	Before	42	0.26	141	8.82
		After	14	0.05	141	8.82
002	2500 rpm	Before	80	0.26	162	8.60
		After	75	0.26	162	8.60
	Idle	Before	56	0.20	141	8.38
		After	51	0.15	141	8.38
003	2500 rpm	Before	61	0.15	141	8.38
		After	37	0.05	141	8.60
	Idle	Before	33	0.10	121	8.17
		After	19	0.05	121	8.17
004	2500 rpm	Before	113	0.30	99	8.52
		After	89	0.15	119	8.72
	Idle	Before	70	0.41	79	8.33
		After	51	0.10	79	8.72
005	2500 rpm	Before	113	0.31	99	8.52
		After	84	0.15	119	8.72
	Idle	Before	65	0.36	79	8.33
		After	51	0.15	79	8.52
006	2500 rpm	Before	127	0.36	119	8.33
		After	108	0.31	139	8.72
	Idle	Before	75	0.31	99	8.52
		After	65	0.15	99	8.52
023	2500 rpm	Before	75	0.31	119	8.72
		After	75	0.36	119	8.72
	Idle	Before	46	0.25	99	8.33
		After	46	0.20	99	8.33

Table 55-A

Federal Two-Speed Idle Test Data

Car No. 5

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	80	0.42	121	10.50
		After	23	0.05	162	11.02
	Idle	Before	249	0.20	100	9.28
		After	33	0.05	121	10.76
002	2500 rpm	Before	89	0.36	121	10.76
		After	75	0.36	121	10.76
	Idle	Before	733	0.20	121	10.50
		After	774	0.20	121	10.76
003	2500 rpm	Before	98	0.52	79	10.60
		After	75	0.46	99	10.60
	Idle	Before	812	0.20	20	7.58
		After	970	0.15	39	9.53
004	2500 rpm	Before	137	0.52	79	10.60
		After	118	0.46	119	10.60
	Idle	Before	697	0.25	79	8.72
		After	697	0.20	79	10.17
005	2500 rpm	Before	132	0.57	99	10.38
		After	123	0.52	119	10.38
	Idle	Before	440	0.20	79	7.95
		After	548	0.20	79	7.95
023	2500 rpm	Before	98	0.46	99	10.60
		After	98	0.46	99	10.60
	Idle	Before	273	0.20	79	9.12
		After	289	0.25	79	10.60

Table 56-A

Federal Two-Speed Idle Test Data

Car No. 6

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	28	0.15	60	9.28
		After	9	0.05	100	9.28
	Idle	Before	188	0.15	60	8.82
		After	19	0.05	80	9.05
002	2500 rpm	Before	47	0.15	121	9.51
		After	47	0.15	121	9.51
	Idle	Before	148	0.15	100	8.82
		After	168	0.15	100	8.82
003	2500 rpm	Before	61	0.15	60	8.82
		After	37	0.05	80	9.05
	Idle	Before	295	0.15	60	8.38
		After	143	0.05	60	8.38
004	2500 rpm	Before	56	0.25	79	9.12
		After	46	0.15	99	9.12
	Idle	Before	294	0.20	39	8.14
		After	172	0.10	39	8.52
005	2500 rpm	Before	60	0.20	59	8.72
		After	46	0.15	99	8.92
	Idle	Before	289	0.20	59	8.52
		After	207	0.10	59	8.52
006	2500 rpm	Before	56	0.20	59	8.92
		After	51	0.10	89	8.92
	Idle	Before	42	0.15	59	8.72
		After	23	0.10	59	8.72
007	2500 rpm	Before	65	0.20	59	9.32
		After	46	0.15	99	9.12
	Idle	Before	278	0.20	39	8.33
		After	364	0.20	39	8.33

Table 56-A (Continued)

Federal Two-Speed Idle Test Data

Car No. 6

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
008	2500 rpm	Before	123	0.20	59	8.72
		After	65	0.10	79	8.92
	Idle	Before	331	0.15	20	8.33
		After	197	0.05	39	8.52
009	2500 rpm	Before	89	0.25	59	8.72
		After	89	0.15	99	8.72
	Idle	Before	385	0.20	39	8.14
		After	226	0.10	39	8.33
021	2500 rpm	Before	113	0.25	59	8.52
		After	123	0.15	99	8.52
	Idle	Before	374	0.20	59	8.14
		After	299	0.10	59	8.33
023	2500 rpm	Before	70	0.25	39	9.12
		After	94	0.25	39	9.12
	Idle	Before	167	0.20	39	8.92
		After	227	0.20	39	8.72

Table 57-A

Federal Two-Speed Idle Test Data

Car No. 7

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	33	0.59	247	14.33
		After	9	0.05	60	14.68
	Idle	Before	75	0.36	162	14.33
		After	14	0.05	60	14.68
002	2500 rpm	Before	37	0.53	290	14.00
		After	33	0.53	290	14.00
	Idle	Before	75	0.36	162	14.00
		After	70	0.36	141	13.67
003	2500 rpm	Before	75	1.02	222	13.72
		After	46	0.73	79	14.24
	Idle	Before	132	0.73	119	13.98
		After	51	0.30	39	14.50
004	2500 rpm	Before	79	0.90	243	13.72
		After	56	0.79	119	14.24
	Idle	Before	118	0.62	139	13.98
		After	56	0.31	59	14.50
005	2500 rpm	Before	98	0.96	160	13.98
		After	70	0.90	79	14.24
	Idle	Before	137	0.73	99	13.98
		After	65	0.31	39	14.50
006	2500 rpm	Before	103	0.90	201	13.72
		After	79	0.90	99	13.98
	Idle	Before	132	0.68	119	13.98
		After	75	0.31	39	14.24
023	2500 rpm	Before	51	0.62	243	14.24
		After	46	0.62	264	14.24
	Idle	Before	103	0.46	119	14.24
		After	95	0.46	119	14.24

Table 58-A

Federal Two-Speed Idle Test Data

Car No. 8

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	33	0.64	225	12.43
		After	14	0.05	100	14.68
	Idle	Before	47	0.47	100	10.50
		After	14	0.05	80	14.68
002	2500 rpm	Before	42	0.70	290	14.00
		After	47	0.76	290	14.00
	Idle	Before	75	0.64	162	14.00
		After	80	0.64	183	14.00
003	2500 rpm	Before	89	1.95	180	13.46
		After	94	1.69	79	13.72
	Idle	Before	289	7.30	99	10.38
		After	315	7.18	99	10.38
004	2500 rpm	Before	98	0.79	243	13.46
		After	42	0.20	99	14.24
	Idle	Before	142	1.20	139	13.72
		After	28	0.31	79	14.24
005	2500 rpm	Before	60	0.79	243	13.46
		After	46	0.15	119	14.24
	Idle	Before	103	0.68	139	13.72
		After	32	0.10	79	14.50
006	2500 rpm	Before	147	0.79	223	13.46
		After	56	0.15	99	14.50
	Idle	Before	118	0.62	119	13.72
		After	28	0.10	99	14.24
007	2500 rpm	Before	84	0.79	264	13.21
		After	37	0.15	119	14.24
	Idle	Before	103	0.62	139	13.46
		After	23	0.10	99	14.24

Table 58-A (Continued)

Federal Two-Speed Idle Test Data

Car No. 8

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
008	2500 rpm	Before	127	0.62	223	13.21
		After	75	0.15	119	14.24
	Idle	Before	94	0.46	119	13.72
		After	37	0.10	99	14.28
023	2500 rpm	Before	60	0.79	222	13.98
		After	56	0.79	222	13.98
	Idle	Before	98	0.79	119	13.98
		After	103	0.85	119	13.98

Table 59-A

Federal Two-Speed Idle Test Data

Car No. 9

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	28	0.76	204	14.00
		After	9	0.10	20	14.68
	Idle	Before	104	0.70	80	13.67
		After	14	0.05	60	14.33
002	2500 rpm	Before	14	0.76	204	14.33
		After	14	0.76	225	14.00
	Idle	Before	61	0.70	121	13.67
		After	61	0.64	141	13.35
003	2500 rpm	Before	60	1.44	243	13.72
		After	60	1.26	59	13.98
	Idle	Before	113	1.32	160	13.72
		After	108	1.02	59	13.98
004	2500 rpm	Before	42	1.02	201	13.98
		After	32	0.57	79	14.24
	Idle	Before	123	1.08	99	13.72
		After	123	0.62	59	14.24
005	2500 rpm	Before	28	0.85	180	13.98
		After	37	0.96	139	13.98
	Idle	Before	98	1.08	99	13.72
		After	94	0.57	59	14.24
006	2500 rpm	Before	46	0.85	285	13.72
		After	46	0.52	180	13.98
	Idle	Before	108	0.85	99	13.72
		After	103	0.25	59	14.24

Table 59-A (Continued)

Federal Two-Speed Idle Test Data

Car No. 9

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
007	2500 rpm	Before	32	0.73	180	13.98
		After	23	0.31	79	14.24
	Idle	Before	103	0.85	119	13.72
		After	94	0.20	59	14.24
008	2500 rpm	Before	32	0.79	180	13.98
		After	28	0.25	79	14.24
	Idle	Before	94	1.14	99	13.72
		After	98	0.10	59	14.50
009	2500 rpm	Before	32	0.79	201	13.46
		After	32	0.15	160	14.24
	Idle	Before	75	0.73	99	13.21
		After	75	0.15	99	13.72
010	2500 rpm	Before	42	0.79	222	13.46
		After	32	0.10	139	14.24
	Idle	Before	84	0.85	79	13.21
		After	84	0.10	79	13.72

Table 60-A

Federal Two-Speed Idle Test Data

Car No. 10

Test No.	Speed	Catalyst	HC	CO	NOx	CO_2
001	2500 rpm	Before	33	0.70	204	14.00
		After	5	0.05	20	14.68
	Idle	Before	66	0.88	100	13.67
		After	14	0.05	40	14.68
002	2500 rpm	Before	33	0.64	333	14.33
		After	33	0.59	333	14.33
	Idle	Before	70	0.88	121	14.00
		After	80	0.82	141	13.67
003	2500 rpm	Before	60	1.19	201	13.72
		After	56	0.90	59	13.98
	Idle	Before	70	1.76	99	13.46
		After	70	1.38	59	13.72
004	2500 rpm	Before	60	1.02	222	13.72
		After	60	0.62	99	14.24
	Idle	Before	70	1.20	79	13.72
		After	75	0.85	59	13.98
023	2500 rpm	Before	28	0.73	222	14.24
		After	28	0.73	222	14.24
	Idle	Before	56	0.85	99	14.24
		After	65	0.79	99	14.24

Table 61

WORK EFFORT NO. 3 - CATALYST RECOVERY TESTS

FTP CVS-75 EXHAUST EMISSIONS TEST DATA

1979 FORD GRANADA - VEHICLE # 21

Date	Test No.	Odometer (Miles)	Accumulative Unleaded Gas Used in Recovery (gallons)	Exhaust Emissions (g/m)				Fuel Economy (MPG)	Catalyst Efficiency* (%)	Remarks
				HC	CO	CO_2	NOx			
7-31-79	001	15098	0	0.39	3.69	625	0.77	14.0	80**	Baseline 1
8-02-79	002	15120	0	0.47	3.64	618	0.87	14.2		" 2
One Tank of Leaded Gasoline (18.0 gallons)										
8-10-79	010	15382	36.0	1.03	5.29	588	0.97	14.8	52	Poisoning Test
8-14-79	020	15675	53.0	0.76	3.81	596	0.91	14.7	65	1st Recovery
8-16-79	021	15995	69.0	0.74	3.41	577	0.95	15.2	66	2nd "
8-23-79	022	16291	85.5	0.68	3.73	583	1.04	15.0	68	3rd "
8-29-79	023	16586	102.5	0.61	3.64	584	0.97	15.0	71	4th "
9-12-79	024	16855	116.9	0.70	4.34	603	0.92	14.5	67	5th "
9-21-79	025	17089		0.61	3.88	606	0.72	14.4	71	6th "
9-21-79		Vehicle was inspected at the State MVIP station and passed the emissions standards. Vehicle was released on the same day.								

*Based on HC Emissions

**Estimated (see text).

Table 62

WORK EFFORT NO. 3 - CATALYST RECOVERY TESTS

FTP CVS-75 EXHAUST EMISSIONS TEST DATA

1979 FORD FAIRMONT - VEHICLE # 22

Date	Test No.	Odometer (Miles)	Accumulative Unleaded Gas Used in Recovery (gallons)	Exhaust Emissions (g/m) HC	CO	CO_2	NOx	Fuel Economy (MPG)	Catalyst Efficiency* (%)	Remarks
7-31-79	001	13703	0	0.54	2.98	649	0.67	13.5	80*	Baseline 1
8-01-79	002	13714	0	0.53	2.48	645	0.68	13.6		" 2
One Tank of Leaded Gasoline (16.5 gallons)										
8-07-79	010	13973	35.3	1.68	9.48	638	0.67	13.5	37	Poisoning Test
8-10-79	020	14204	50.8	Void - Sampling Problem						1st Recovery
8-14-79	021	14467	66.7	1.20	6.55	645	0.69	13.5	55	2nd "
8-21-79	022	14702	82.7	0.83	2.93	649	0.69	13.5	69	3rd "
8-24-79	023	14934	100.5	0.76	2.47	634	0.72	13.8	72	4th "
9-12-79	024	15216	117.9	0.91	3.33	650	0.70	13.5	66	5th "
9-20-79	025	15447		0.76	2.80	614	0.70	14.3	72	6th "

9-12-79 Vehicle was inspected at the State MVIP station and passed emissions standards. Vehicle was released on the same day.

*Based on HC emissions
**Estimated (see text).

Table 63

WORK EFFORT NO. 3 - CATALYST RECOVERY TESTS

FTP CVS-75 EXHAUST EMISSIONS TEST DATA

1979 CHEVROLET CAPRICE - VEHICLE # 23

Date	Test No.	Odometer (Miles)	Accumulative Unleaded Gas Used in Recovery (gallons)	Exhaust Emissions (g/m)				Fuel Economy (MPG)	Catalyst Efficiency* (%)	Remarks
				HC	CO	CO_2	NOx			
7-31-79	001	18560	0	0.37	5.66	693	0.98	12.6	80**	Baseline 1
8-01-79	002	18571	0	0.44	6.30	689	0.98	12.7		" 2
One Tank of Leaded Gasoline (21.0 gallons)										
8-07-79	010	18845		0.71	7.65	693	0.98	12.6	65	Poisoning Test
8-10-79	020	19146	21.9	0.53	6.00	695	0.96	12.6	74	1st Recovery
8-16-79	021	19450	62.2	0.61	8.87	704	0.90	12.3	70	2nd Recovery
8-22-79	022	19677	81.6	0.43	6.66	705	0.97	12.4	79	3rd "
8-28-79	023	19957	99.6	0.53	7.53	715	1.03	12.2	74	4th "
8-31-79	024	20195	105.6	0.49	6.22	696	0.99	12.5	76	5th "
9-20-79		Vehicle was inspected at the State MVIP station and passed the emissions standards. Vehicle was released on the same day.								

*Based on HC Emissions
**Estimated (see text)

Table 64

WORK EFFORT NO. 3 - CATALYST RECOVERY TESTS

FTP CVS-75 EXHAUST EMISSIONS TEST DATA

1979 CHRYSLER CORDOBA - VEHICLE # 24

Date	Test No.	Odometer (Miles)	Accumulative Unleaded Gas Used in Recovery (gallons)	Exhaust Emissions (g/m) HC	CO	CO_2	NOx	Fuel Economy (MPG)	Catalyst Efficiency* (%)	Remarks
7-31-79	001	10411		0.37	2.22	709	1.17	12.4	80**	Baseline 1
8-01-79	002	10422		0.35	2.21	699	1.09	12.6		" 2
One Tank of Leaded Gasoline (23.0 gallons)										
8-07-79	010	10809		1.02	4.61	700	1.02	12.5	43	Poisoning Test
8-14-79	020	11163	44.7	1.54	2.74	704	1.23	12.5	70	1st Recovery
8-17-79	021	11527	66.9	0.67	2.92	722	1.36	12.2	63	2nd "
8-28-79	022	11950	93.1	0.73	3.00	714	1.43	12.3	59	3rd "
8-31-79	023	12368	115.1	0.63	3.00	702	1.26	12.5	65	4th "
9-18-79	024	12689	135.1	0.56	1.90	683	1.24	12.9	69	5th "
9-25-79	025	13060	161.2	0.58	2.19	703	1.25	12.5	68	6th "
9-27-79	026	13371	181.0	0.54	1.59		1.21	12.6	70	7th "

9-27-79 Vehicle was inspected at the State MVIP station and passed emissions standards. Vehicle was released on the same day.

*Based on HC Emissions
**Estimated (see text)

Table 65

WORK EFFORT NO. 3 - CATALYST RECOVERY TESTS

FTP CVS-75 EXHAUST EMISSIONS TEST DATA

1979 CHEVROLET MALIBU - VEHICLE # 25

Date	Test No.	Odometer (Miles)	Accumulative Unleaded Gas Used in Recovery (gallons)	Exhaust Emissions (g/m)				Fuel Economy (MPG)	Catalyst Efficiency* (%)	Remarks
				HC	CO	CO_2	NOx			
8-03-79	001	14041	0	0.55	10.03	569	0.74	15.1	80**	Baseline 1
8-07-79	002	14059	0	0.56	11.06	556	0.70	15.4		" 2
One Tank of Leaded Gasoline (19.0 gallons)										
8-14-79	010	14356		1.14	8.45	561	0.75	15.3	59	Poisoning Test
8-16-79	020	14613	33.1	0.71	8.52	566	0.74	15.3	74	1st Recovery
8-21-79	021	14936	49.1	0.59	9.29	574	0.75	15.0	79	2nd "
8-24-79	022	15179	64.7	0.66	10.75	572	0.72	15.0	76	3rd "
8-29-79	023	15433	76.7	0.66	7.14	569	0.76	15.2	76	4th "
8-31-79	024	15620	91.7	0.69	9.61	567	0.80	15.2	75	5th "
9-20-79		Vehicle was inspected at the State MVIP station and passed emissions standards. Vehicle was released on the same day.								

*Based on HC Emissions
**Estimated (See text).

Table 66

Exhaust Backpressure Test Data (psig)

Car No.	Test Date	With Catalyst	Test Date	With By-pass Pipe	Test Date	With Catalyst	Test Date	Engine Out	Test Date	With By-pass Pipe
1	7/31	0.45	8/8	0.38	8/16	0.42	10/12	0.60	10/16	0.45
2	8/2	0.80	8/14	0.65	8/17	0.80	9/12	0.85	9/24	0.60
3	8/2	0.59	8/14	0.50	8/17	0.55	9/12	0.60	9/24	0.52
4	7/31	0.80	8/10	0.87	8/17	0.80	9/12	0.75	9/18	0.84
5	7/31	0.70	8/13	0.68	8/20	0.65	9/12	0.72	9/18	0.69
6	7/31	0.50	8/10	0.52	8/15	0.43	10/2	0.45	10/5	0.50
7	8/15	0.45	8/21	0.48	8/24	0.39	9/17	0.45	9/28	0.48
8	8/17	0.15	8/20	0.23	8/23	0.14	9/24	0.15	10/1	0.20
9	8/14	0.39	8/20	0.42	8/23	0.42	-	-	-	-
10	8/16	0.42	8/20	0.42	8/23	0.43	9/6	0.37	9/19	0.36

ATTACHMENTS

Attachment #1

State of California **The Resources Agency**

Memorandum

To : Jerry Wendt, Manager,
Air Quality Monitoring South Section

Date : September 20, 1979

Subject: Results of the Lead Analysis of Samples from the Gasoline Sample Project 2R7907A

From : **Air Resources Board**
Rupee Torre RT
Ross Wright

The Section has received a request from the Mobile Source Control Division to analyze four gasoline samples for their lead content. These samples are identified with the Gasoline Sample Project 2R7907A. The method of analysis used is the ASTM Method D3237-74 "Lead in Gasoline by Atomic Absorption Spectrometry". The lead content of the four gasoline samples was beyond the concentration range of the method, .010 to 0.10 gram lead/gallon and it was therefore necessary to dilute each of the gasoline samples before analysis.

The results of the analysis for lead in the four gasoline samples are summarized below:

Sample ID	Grams Pb/gallon
Gasoline Sample Project 2R7907A Underground Storage Source 8-2-79	2.532
"Pump leaded gas" 8-20-79	2.564
Leaded gas 9:00 AM 8-27-79	2.548
Leaded gas 9-16-79	2.362

cc: John Chao
Amir Tacawy

Attachment # 2

Summary of Gasoline Consumption in Gallons
EPA Contract No. 68-03-2783

Vehicle No.	Arco Clear	Indolene Clear	Leaded
1	21.0	44.3	151.8
2	21.2	29.4	62.5
3	31.2	44.5	56.6
4	32.8	50.5	72.0
5	24.47	40.5	59.0
6	26.7	36.0	138.3
7	-	46.2	67.2
8	-	51.4	64.3
9	-	36.3	105.5
10	-	59.1	26.4
21	-	116.9	18.0
22	-	117.7	16.5
23	-	115.6	21.0
24	-	184.0	16.8
25	-	91.7	19.0
Totals	157.37	1064.1	894.9

Grand Total 2,116.37 gallons

3500 gallons of leaded fuel were purchased on July 23, 1979
(Sub P.O. #9-5024)

Measuring the remaining leaded fuel with a dipstick on 10/26/79 indicated approximately 2550 gallons remaining.

ATTACHMENT #3

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Federal Three Mode Test

The test procedure is preceded by a six minute soak as described under the Federal Short Cycle.

The instruments used for measurement of undiluted HC, CO and NO emissions are specific in VI, F, 4a of the Scope of Work.

This short test consists of three steady state operating modes (similar to Clayton Key Mode) from which undiluted exhaust samples are taken with the dynamometer loads simulating the average power which occurs at the appropriate speed on the FTP with all light duty vehicles being grouped into weight classes. At the end of the soak period the vehicle will be operated for a maximum of three minutes at the Mode specified speed with the hood open and the cooling fan on. The inertia weight shall be set at 0 or 1750 whichever is less. During this stabilization period the specified dyno load horsepower shall be set. The test shall be performed in the order of high cruise, low cruise, and idle. At each speed, equilibrium of vehicle speed and the CO, HC and NO analyzer meters shall be maintained for 30 seconds before the readings are recorded. CO, HC and NO shall be measured and reported in % CO, ppm/Hexane and ppm NO respectively. Emissions are measured by the volumetric procedure for each mode. Since actual horsepower will be used for this test, additional dynamometer coastdown calibrations at 25 and 52 mph are required. The weight of the vehicle shall be determined by adding 400 lbs. to the NADA shipping weight.

The Project Officer will supply a chart of the road load settings for each speed before testing begins.

The test will be conducted with the vehicle's hood open and auxiliary cooling fan in-use.

Chart for Horsepower
settings for
Revised Federal Three Mode
short test

Reproduced from
best available copy.

WT. RANGE	ROAD LOAD RANGE	HP:I	HP:II
LESS 1125	2.51 - 3.50	2.0	4.
LESS 1125	3.51 - 4.50	2.0	5.
LESS 1125	4.51 - 5.50	2.0	6.
LESS 1125	5.51 - 6.50	2.5	7.
1126-1375	3.51 - 4.50	2.5	5.
1126-1375	4.51 - 5.50	2.5	6.
1126-1375	5.51 - 6.50	3.0	7.
1126-1375	6.51 - 7.50	3.0	8.
1376-1625	3.51 - 4.50	3.0	6.
1376-1625	4.51 - 5.50	3.0	6.
1376-1625	5.51 - 6.50	3.5	8.
1376-1625	6.51 - 7.50	3.5	9.
1626-1875	4.51 - 5.50	3.5	7.
1626-1875	5.51 - 6.50	4.0	8.
1626-1875	6.51 - 7.50	4.0	9.
1626-1875	7.51 - 8.50	4.0	10.
1876-2125	4.51 - 5.50	4.0	7.
1876-2125	5.51 - 6.50	4.5	8.
1876-2125	6.51 - 7.50	4.5	9.
1876-2125	7.51 - 8.50	4.5	10.
2126-2375	4.51 - 5.50	5.0	8.
2126-2375	5.51 - 6.50	5.0	9.
2126-2375	6.51 - 7.50	5.0	10.
2126-2375	7.51 - 8.50	5.0	10.
2126-2375	8.51 - 9.50	5.0	12.
2126-2375	9.51 - 10.50	5.0	12.
2126-2375	10.51 - 11.50	5.0	14.
2126-2375	11.51 - 12.50	5.0	15.
2126-2375	12.51 - 13.50	5.0	16.
2126-2375	13.51 - 14.50	5.5	17.
2126-2375	14.51 - 15.50	5.5	18.
2376-2625	4.51 - 5.50	5.0	8.
2376-2625	5.51 - 6.50	5.5	9.
2376-2625	6.51 - 7.50	5.5	10.
2376-2625	7.51 - 8.50	5.5	11.
2376-2625	8.51 - 9.50	5.5	12
2376-2625	9.51 - 10.50	5.5	13
2376-2625	10.51 - 11.50	5.5	14
2376-2625	11.51 - 12.50	5.5	15
2376-2625	12.51 - 13.50	5.5	16
2376-2625	13.51 - 14.50	5.5	17
2376-2625	14.51 - 15.50	6.0	18
2626-2875	4.51 - 5.50	5.5	9
2626-2875	5.51 - 6.50	6.0	10
2626-2875	6.51 - 7.50	6.0	10
2626-2875	7.51 - 8.50	6.0	11
2626-2875	8.51 - 9.50	6.0	12
2626-2875	9.51 - 10.50	6.0	13
2626-2875	10.51 - 11.50	6.0	14
2626-2875	11.51 - 12.50	6.0	15
2626-2875	12.51 - 13.50	6.0	16
2626-2875	13.51 - 14.50	6.0	17
2626-2875	14.51 - 15.50	6.5	18
2876-3250	5.51 - 6.50	6.5	10
2876-3250	6.51 - 7.50	6.5	11.
2876-3250	7.51 - 8.50	6.5	12.
2876-3250	8.51 - 9.50	6.5	13
2876-3250	9.51 - 10.50	6.5	13

7/27/77

2876-3250	10.51 - 11.50	6.5	14.
2876-3250	11.51 - 12.50	6.5	16.
2876-3250	12.51 - 13.50	6.5	16.
2876-3250	13.51 - 14.50	6.5	17.
2876-3250	14.51 - 15.50	7.0	18.
2876-3250	15.51 - 16.50	7.0	19.
2876-3250	16.51 - 17.50	7.0	21.
2876-3250	17.51 - 18.50	7.0	22.
2876-3250	18.51 - 19.50	7.0	23.
2876-3250	19.51 - 20.50	7.0	24.
2876-3250	20.51 - 21.50	7.0	25.
2876-3250	21.51 - 22.50	7.5	26.
2876-3250	22.51 - 23.50	7.5	27.
2876-3250	23.51 - 24.50	7.5	28.
3251-3750	5.51 - 6.50	7.5	11.
3251-3750	6.51 - 7.50	7.5	12.
3251-3750	7.51 - 8.50	7.5	13.
3251-3750	8.51 - 9.50	7.5	13.
3251-3750	9.51 - 10.50	7.5	14.
3251-3750	10.51 - 11.50	7.5	15.
3251-3750	11.51 - 12.50	7.5	16.
3251-3750	12.51 - 13.50	7.5	17.
3251-3750	13.51 - 14.50	7.5	18.
3251-3750	14.51 - 15.50	8.0	19.
3251-3750	15.51 - 16.50	8.0	20.
3251-3750	16.51 - 17.50	8.0	21.
3251-3750	17.51 - 18.50	8.0	22.
3251-3750	18.51 - 19.50	8.0	23.
3251-3750	19.51 - 20.50	8.0	24.
3251-3750	20.51 - 21.50	8.0	25.
3251-3750	21.51 - 22.50	8.0	26.
3251-3750	22.51 - 23.50	8.5	27.
3251-3750	23.51 - 24.50	8.5	28.

WT. RANGE	ROAD LOAD RANGE	HP:L	HP:H
3751-4250	5.51 - 6.50	8.5	12.5
1-4250	6.51 - 7.50	8.5	13.0
3751-4250	7.51 - 8.50	8.5	14.0
3751-4250	8.51 - 9.50	8.5	14.5
3751-4250	9.51 - 10.50	8.5	15.5
3751-4250	10.51 - 11.50	8.5	16.5
3751-4250	11.51 - 12.50	8.5	17.0
3751-4250	12.51 - 13.50	8.5	18.0
3751-4250	13.51 - 14.50	8.5	19.0
3751-4250	14.51 - 15.50	8.5	20.0
3751-4250	15.51 - 16.50	9.0	21.0
3751-4250	16.51 - 17.50	9.0	22.0
3751-4250	17.51 - 18.50	9.0	23.0
3751-4250	18.51 - 19.50	9.0	24.0
3751-4250	19.51 - 20.50	9.0	25.0
3751-4250	20.51 - 21.50	9.0	26.0
3751-4250	21.51 - 22.50	9.0	27.0
3751-4250	22.51 - 23.50	9.5	28.0
3751-4250	23.51 - 24.50	9.5	29.0
4251-4750	5.51 - 6.50	9.5	13.5
4251-4750	6.51 - 7.50	9.5	13.5
4251-4750	7.51 - 8.50	9.5	14.5
4251-4750	8.51 - 9.50	9.5	15.5
4251-4750	9.51 - 10.50	9.5	16.5
4251-4750	10.51 - 11.50	9.5	17.0
4251-4750	11.51 - 12.50	9.5	18.0
51-4750	12.51 - 13.50	9.5	19.0
4251-4750	13.51 - 14.50	9.5	19.5
4251-4750	14.51 - 15.50	9.5	20.5
4251-4750	15.51 - 16.50	9.5	21.5
4251-4750	16.51 - 17.50	10.0	22.5
4251-4750	17.51 - 18.50	10.0	23.5
4251-4750	18.51 - 19.50	10.0	24.5
4251-4750	19.51 - 20.50	10.0	25.5
4251-4750	20.51 - 21.50	10.0	26.5
4251-4750	21.51 - 22.50	10.0	27.5
4251-4750	22.51 - 23.50	10.0	28.5
4251-4750	23.51 - 24.50	10.0	29.5
4751-5250	6.51 - 7.50	10.5	15.0
4751-5250	7.51 - 8.50	10.5	15.5
4751-5250	8.51 - 9.50	10.5	16.5
4751-5250	9.51 - 10.50	10.5	17.0
4751-5250	10.51 - 11.50	10.5	18.0
4751-5250	11.51 - 12.50	10.5	19.0
4751-5250	12.51 - 13.50	10.5	19.5
4751-5250	13.51 - 14.50	10.5	21.0
4751-5250	14.51 - 15.50	10.5	21.5
4751-5250	15.51 - 16.50	10.5	22.5
4751-5250	16.51 - 17.50	11.0	23.0
4751-5250	17.51 - 18.50	11.0	24.0
751-5250	18.51 - 19.50	11.0	25.0
751-5250	19.51 - 20.50	11.0	26.5
4751-5250	20.51 - 21.50	11.0	27.0
4751-5250	21.51 - 22.50	11.0	28.0
4751-5250	22.51 - 23.50	11.0	29.0
4751-5250	23.51 - 24.50	11.0	30.0
5251-5750	6.51 - 7.50	11.5	16.0
[illegible]	[illegible]	[illegible]	16.5

7/27/77

5251-5750	8.51 - 9.50	11.5	17.0
5251-5750	9.51 - 10.50	11.5	18.0
5251-5750	10.51 - 11.50	11.5	19.0
5251-5750	11.51 - 12.50	11.5	19.5
5251-5750	12.51 - 13.50	11.5	20.5
5251-5750	13.51 - 14.50	11.5	21.5
5251-5750	14.51 - 15.50	11.5	22.5
5251-5750	15.51 - 16.50	11.5	23.0
5251-5750	16.51 - 17.50	11.5	24.0
5251-5750	17.51 - 18.50	12.0	24.5
5251-5750	18.51 - 19.50	12.0	25.5
5251-5750	19.51 - 20.50	12.0	26.5
5251-5750	20.51 - 21.50	12.0	28.0
5251-5750	21.51 - 22.50	12.0	29.0
5251-5750	22.51 - 23.50	12.0	29.5
5251-5750	23.51 - 24.50	12.5	30.5
5751-6250	7.51 - 8.50	12.5	17.5
5751-6250	8.51 - 9.50	12.5	18.5
5751-6250	9.51 - 10.50	12.5	19.0
5751-6250	10.51 - 11.50	12.5	20.0
5751-6250	11.51 - 12.50	12.5	20.5
5751-6250	12.51 - 13.50	12.5	21.5
5751-6250	13.51 - 14.50	12.5	22.0
5751-6250	14.51 - 15.50	12.5	23.0
5751-6250	15.51 - 16.50	12.5	24.0
5751-6250	16.51 - 17.50	13.0	25.0
5751-6250	17.51 - 18.50	13.0	25.5
5751-6250	18.51 - 19.50	13.0	26.5
5751-6250	19.51 - 20.50	13.0	27.0
5751-6250	20.51 - 21.50	13.0	28.0
5751-6250	21.51 - 22.50	13.0	29.5
5751-6250	22.51 - 23.50	13.0	30.5
5751-6250	23.51 - 24.50	13.0	31.5

State of California ATTACHMENT #4 The Resources Agency

Memorandum

To : Al Donnelly, Chief
Testing and Operations Branch

Date : August 15, 1978

Subject: Title 13 Testing

From : Air Resources Board
K. D. Drachand, Chief
Engineering Branch

The staff is currently investigating incorporating a loaded mode test into the Assembly Line Test Procedures to improve emission control system quality control at the manufacturing plant. We currently do not have an adequate data base for new car performance in a loaded mode emission test. Consequently, we would like to have the three mode test, for information (in nuetral (Idle; Low and High Cruise-see below) incorporated into the Title 13 tests to establish the necessary new vehicle data base. The loaded mode test results should be reported along with the CVS certification test results to the Special Projects Section using the standard forms.

Vehicle Curb Weight Plus 300 lb.	Driving Cycle (Speed-Load Combination)	
	Low Cruise	High Cruise
3801 lb. and above	32-35 MPH @ 10-12 hp	4~~0~~8-50 MPH @ 27-30 hp
2801 lb. to 3801 lb.	29-32 MPH @ 8-10 hp	44-46 MPH @ 21-24 hp
2000 lb. to 2800 lb.	22-25 MPH @ 4-6 hp.	36-38 MPH @ 13-15 hp
2000 lb. and below	18-21 MPH @ 2-4 hp	33-35 MPH @ 7-9- hp

cc: Paul Newmark

Attachment # 5.

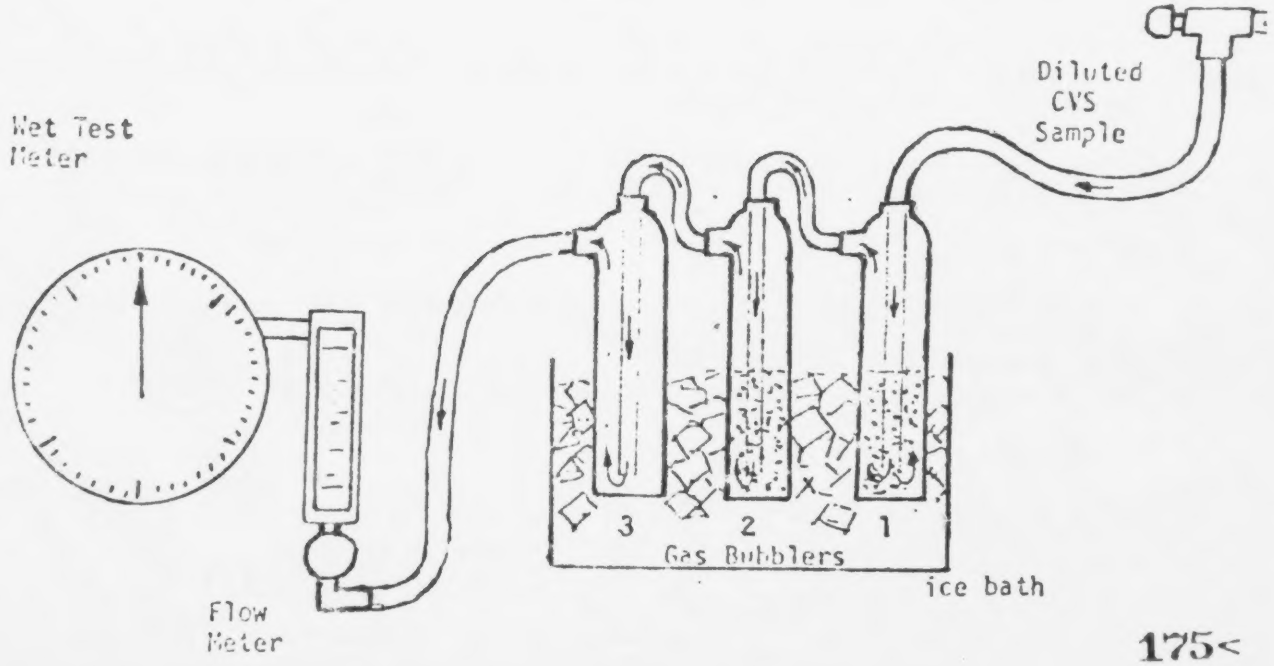
ALDEHYDES

Preparation of MBTH Solution

1. Measure out .25g MBTH crystals into clean beaker.
2. Add pure water to beaker to get crystals into solution by mixing thoroughly.
3. Pour contents of beaker into 500ml volumetric flask. Add enough pure water to make 500 ml solution.
4. Filter solution using vacuum filter flask with #1 whatman filter in coors funnel.
5. Pour into clean bottle after having rinsed with small amount of prepared solution.
6. Label bottle with expiration date (7th day after preparation).
7. Refrigerate.

Aldehyde Test Set-Up

1. Locate 3 clean gas bubblers.
2. Fill 2 of them with 15 ml of MBTH solution using pipets. Leave the third one emp
3. Hook the bubblers together in series with plastic tubing with the empty bubbler last...As Shown in diagram.



Attachment #5

Aldehyde Test Set-Up (contd)

4. Place bubblers in metal ice bath tray. Add ice water and ice.

5. In dyno bay #3 hook sampling tube from CVS unit to inlet of bubbler #1 and outlet of bubbler #3 to flow meter.

6. Set wet test meter to zero. Balance the meter, fill up with Deionized water Big hand-loosen screw.

Aldehyde Sampling Procedure

1. As car starts, open valve on CVS sample line.

2. Adjust flowmeter for 1 CFH.

3. Obtain methane sample syringes: 1 background and 2 sample for both the cold transient, ~~and~~ cold stable modes and hot transient

4. At completion of cold stable mode, record wet test meter reading. Close valve on CVS sample line.

5. After test, transfer contents of bubbler 1 and 2 into clean dry bottle. Solution trapped in bubbler #3 if any, should be transferred to the same bottle. Refrigerate in sealed bottle.

Analysis of Aldehydes

1. Remove absorbed aldehyde sample from refrigerator after it has been refrigerated for at least 1 hour.

2. Shake sample well.

3. Filter same as MBTH solution and [illegible]

4. Prepare blank: 10 ml MBTH solution, 2 ml oxidizing agent.

5. Observe color of sample: if colorless, dilute 1:1 with MBTH solution If slightly pink, dilute 2:1 with MBTH solution. Add 1 ml of oxidizing agent for every 5 ml of diluted sample.

   NOTE: If reading on spectrophotometer, does not fall within range 30% - 90% transmittance further dilution will be required.

6. Agitate blank and diluted sample and let stand for 10 minutes.

7. Turn on spectrophotometer in conjunction with Tungten power supply. Allow 10 minutes for warm.

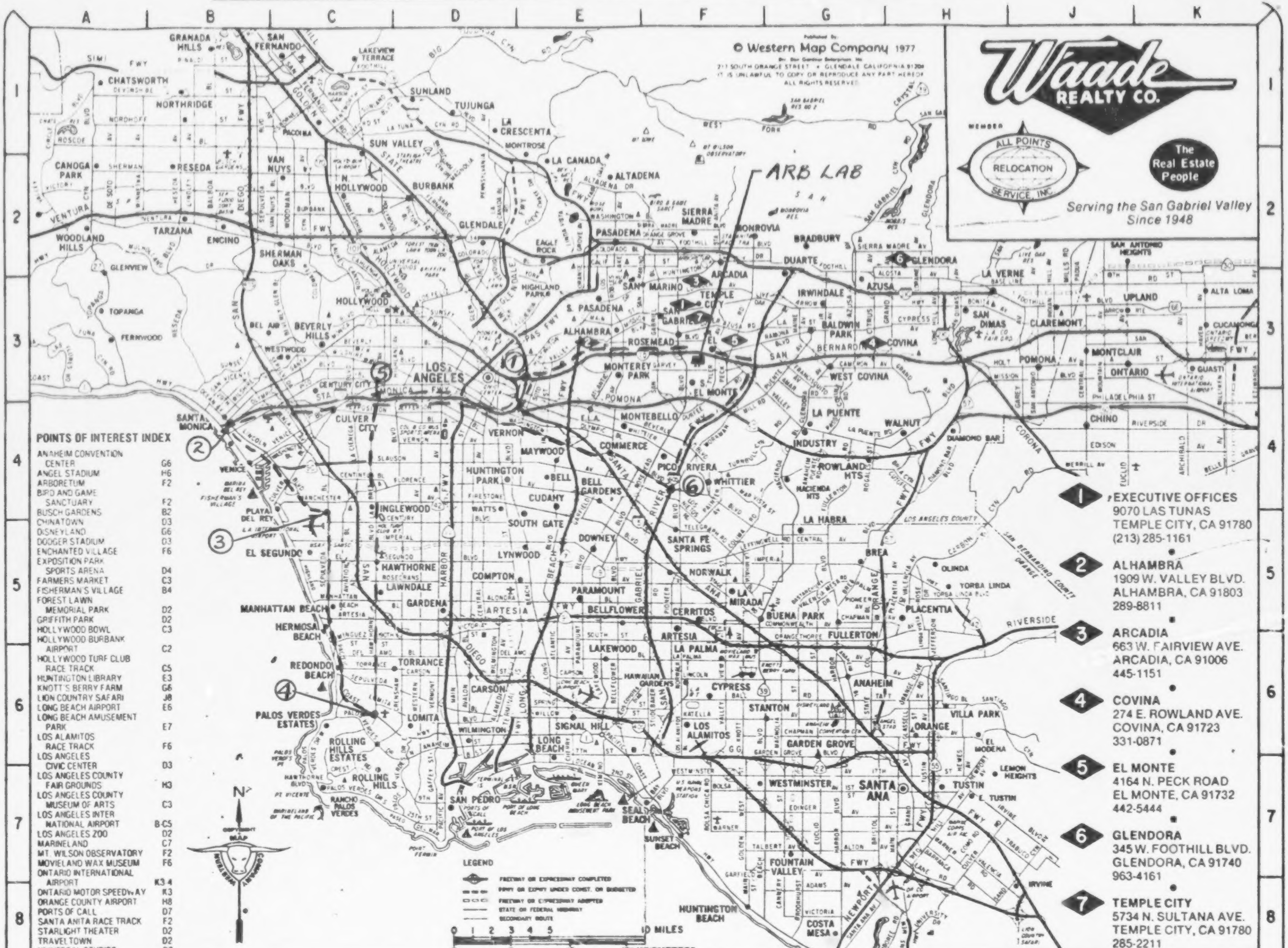
8. Verify wavelength set at 628 mu. Always turn clockwise when changing.

9. Open sample chamber cover and adjust zero.

10. Using blank adjust for 100% transmission.

11. Record percentage of transmittance of sample.

MILEAGE ACCUMMULATION DRIVING ROUTE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FREEWAY OR EXPRESSWAY UNDER CONST. OR BUDGETED
FREEWAY OR EXPRESSWAY ADOPTED
STATE OR FEDERAL HIGHWAY
SECONDARY ROUTE
10 MILES
15 KILOMETERS
LOS ANGELES
PASADENA
SANTA MONICA
LONG BEACH
SANTA ANA

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DODGER STADIUM	D3
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FISHERMAN'S VILLAGE	B4
FOREST LAWN MEMORIAL PARK	D2
GRIFFITH PARK	D2
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UNIVERSAL STUDIOS	D2

1 EXECUTIVE OFFICES
9070 LAS TUNAS
TEMPLE CITY, CA 91780
(213) 285-1161

2 ALHAMBRA
1909 W. VALLEY BLVD.
ALHAMBRA, CA 91803
289-8811

3 ARCADIA
663 W. FAIRVIEW AVE.
ARCADIA, CA 91006
445-1151

4 COVINA
274 E. ROWLAND AVE.
COVINA, CA 91723
331-0871

5 EL MONTE
4164 N. PECK ROAD
EL MONTE, CA 91732
442-5444

6 GLENDORA
345 W. FOOTHILL BLVD.
GLENDORA, CA 91740
963-4161

7 TEMPLE CITY
5734 N. SULTANA AVE.
TEMPLE CITY, CA 91780
285-2211

ATTACHMENT # 6

77-128-377-10-40% LITHO IN USA

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ATTACHMENT #7

State of California **The Resources Agency**

Memorandum

To : John Chao, Manager
Engineering Evaluation Section

Date : October 31, 1979

Subject : Quality Control Tests for EPA Contract #68-03-2783.

From : **Air Resources Board**
M. Nakada MN
Quality Control Section

The Quality Control Section performed the following quality control tests on a weekly basis during July 16, 1979 through October 31, 1979. These tests were conducted to assure that the performances of these instruments and equipment are within the tolerances and specifications for the vehicle emission tests of EPA Contract #68-03-2783.

Gas Analyzer Check

The flame ionization detector (HC), chemiluminescent analyzer (NOx), and non-dispersive infrared analyzers (CO and CO_2) were checked at six different data points of their calibration curves. The data points of each analyzer were found to be within the ±2% tolerance of their calibration curve.

CVS Verification Check

The CVS of each test cell was checked for its accuracy by injecting a known amount of propane into the system and measuring the output with its FID analyzer. Recoveries of propane showed that they are all within the ±2% tolerance of the injected amount.

Dynamometer Check

The dynamometers were checked for their road horsepower by the coastdown method. Each dynamometer was checked at three inertia weights (2000, 3500, 4500 nominal weights). At each inertia weight, the coastdown time was within ±1 second tolerance of the calculated coastdown time.

NOx Conversion Efficiency

The chemiluminescent analyzer of each train was checked for its efficiency in converting nitrogen dioxide (NO_2) into nitric oxide (NO). Conversion efficiencies of each analyzer exceeded the minimum requirement of 95% efficiency.

During this reporting period, July 16, 1979 through October 31, 1979, none of these instruments or equipment required recalibration.

The data of these tests are reported in the monthly quality control memorandums.

ATTACHMENT # 8

Page 1 of 7

VEHICLE HISTORY

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
7/23/79	3544 3572	Received at ARB Prechecked-Preconditioned	Set to factory specs Tightened loose air pump bolts

Baseline Test (Pre-poisoning tests)

Date	Odometer	Activity	Remarks
7/24/79	3572 3583	CVS-75 - 1	Original Catalyst Unleaded fuel
7/25/79	3583	Installed new catalyst	
7/25/79	3584 3687	Accumulated 103 miles	Conditioning new catalyst Drive #1 Unleaded fuel-(Arco Clear) Harold Jackson
7/26/79	3687 3873	Accumulated 186 miles (Arco gas receipt missing)	Drive #2 - Unleaded fuel (Arco Clear) Ed Huntley
7/27/79	3873 3969	Filled tank with 15.6 gals of Arco Clear-Accumulated 96 miles.	Drive #3 - Unleaded fuel (Arco Clear) Neil Ehlinger
7/27/79	3969 4062	Filled tank with 5.4 gals of Arco Clear-Accumulated 93 miles	Drive #4 - Unleaded fuel (Arco Clear) H. Leuschner
7/31/79	4062 4069	Preconditioning	
8/01/79	4075 4086	CVS-75 - 2	1st test with new catalyst-unleaded fuel
8/06/79	4109 4116 4138	Warm-up cycle TS-1	Odometer readings 4086-4109 unaccounted for

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
8/09/79	4138 4149	CVS-75 - 3	Bypass - Unleaded fuel
8/14/79	4204 4223	TS-2	Mileage between 4149 and 4204 due to aborted tests
		Catalyst Poisoning Tests	
8/16/79	4223 4230	Filled tank with 20.5 gals of leaded fuel - preconditioned	1st tank of leaded fuel
8/17/79	4230 4241	CVS-75 - 4	1st CVS on leaded fuel
8/17/79	4241 4260	TS-3	
8/21/79	4260 4267	Topped tank with 3.1 gals and accumulated 7 miles	Drive #1 leaded fuel C. Uyemura
8/22/79	4267 4467	Accumulated 193 miles- Filled tank with 11.1 gals of leaded fuel Preconditioned	Drive #2 leaded fuel Troy Jemetz
8/23/79	4467 4478	CVS-75 - 5	2nd CVS on leaded fuel
8/23/79	4478 4503	TS - 4	
8/27/79	4503 4563	Topped tank with 3.7 gals of leaded fuel- Accumulated 60 miles	Drive #3 leaded fuel A. Donnelly

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
8/28/79	4563 4703 4710	Accumulated 140 miles- Filled tank with 13.0 gals of leaded fuel Preconditioned	Drive #4 - leaded fuel 3rd tank N. Ehlinger
8/30/79	4710 4721	CVS-75 - 6	3rd CVS on leaded fuel
8/30/79	4721 4746	TS - 5	
8/31/79	4746 4949	Topped tank with 3.0 gals leaded fuel-Accumulated 203 miles	Drive #5 - leaded fuel Fred Burriell
9/4/79	4949 4956	Filled tank with 12.6 gals of leaded fuel-preconditioned	4th tank of leaded fuel
9/6/79	4956 4967	CVS-75 - 7	4th CVS on leaded fuel
9/6/79	4967 4984	TS-6	
9/7/79	4984 5078	Accumulated 94 miles Filled tank with 17.0 gals of leaded fuel	Drive #6 - leaded fuel - 5th tank Richard Byrd
9/11/79	5078 5182	Accumulated 104 miles	Drive #7 - leaded fuel C. Uyemura
9/12/79	5182 5195	Accumulated 3 miles plus preconditioning	Drive #8 - leaded fuel John Cansler

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
9/13/79	5195 5206	CVS-75 - 8	5th CVS on leaded fuel
9/13/79	5206 5222	TS-7	
9/14/79	5222 5319	Filled tank with 3.1 gals of leaded fuel-Accumulated 97 miles	Drive #9 - leaded fuel Fred Burriell
9/17/79	5319 5414	Accumulated 95 miles. Filled tank with 13.9 gals of leaded fuel	Drive #10 - leaded fuel 6th tank John Robertson
9/17/79	5414 5424	Preconditioned	
9/18/79	5424 5435	CVS-75 - 9	6th CVS on leaded fuel
9/18/79	5434 5461	TS-8	
9/21/79	5461 5559	Filled tank with 3.0 gals of leaded fuel-Accumulated 98 miles	Drive #11 leaded fuel Dennis Sandoval
9/21/79	5559 5660	Accumulated 101 miles	Drive #12 leaded fuel Bob Williams
9/24/79	5660 5668 5696	Warm-up TS-9	
9/25/79	5695 5706	CVS-75 - 10	7th CVS on leaded fuel

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
9/25/79	5695 5706	CVS-75 - 10	7th CVS on leaded fuel
9/26/79	5706 5803	Filled tank with 15.8 gals. of leaded fuel Accumulated 97 miles	Drive #13 leaded fuel-7th tank Eric Yates
9/26/79	5803 5897 5904	Accumulated 94 miles Preconditioned	Drive #14 leaded fuel Bob Williams
9/27/79	5904 5915	CVS-75 - 11	8th CVS on leaded fuel
9/27/79	5915 5931	TS-10	
9/28/79	5931 6026	Filled tank with 15.0 gals. of leaded fuel- Accumulated 95 miles	Drive #15 leaded fuel-8th tank K. Moldenhauer
10/1/79	6026 6114	Accumulated 88 miles	Drive #16 leaded fuel Ernie Trejo
10/1/79	6114 6119 6148	Warm-up TS-11	
10/2/79	6148 6159	CVS-75 - 12	9th CVS on leaded fuel
10/2/79	6159 6322	Filled tank with 17.0 gals. of leaded fuel Accumulated 163 miles	Drive #17 - leaded fuel 9th tank Maury Fleming

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
10/3/79	6322 6359	Accumulated 37 miles	Drive #18 leaded fuel Eric Yates
10/3/79	6359 6367 6391	Preconditioned TS-12 Preconditioned	
10/4/79	6391 6402	CVS-75-13	last test on leaded fuel
		Baseline Tests (Post-poisoning tests)	
10/11/79	6402 6439	Filled tank with 21.3 gals. of Indolene Accumulated 37 miles	Driver unknown
10/12/79	6439 6450	CVS-75 - 14	Unleaded fuel
10/16/79	6450 6463	Accumulated 7 miles Preconditioned	
10/17/79	6463 6474	CVS-75 - 15	Bypass
10/17/79	6474 6496	TS-13	Bypass
10/19/79	6496 6598	Accumulated 102 miles Filled tank with 13.0 gals. of Indolene Clear	
10/19/79	6598 6695	Accumulated 97 miles	
10/22/79	6695 6715 6722	Accumulated 20 miles. Preconditioned	

Vehicle History (continued)

VEHICLE #1: 1979 Camero - License 316 XHW

Date	Odometer	Activity	Remarks
10/23/79	6722 6733 6749	CVS-75 - 16 Accumulated 16 miles. Filled tank with 10.0 gals. of Indolene Clear at 6737 miles.	
10/24/79	6749 6760	CVS-75 - 17	
10/24/79	6760 6837	Replaced catalyst pellets Accumulated 77 miles.	Original OEM Catalyst
10/25/79	6837 6848	CVS-75 - 18	Final test for EPA - Vehicle retained by ARB for Other programs

Total Miles		Total Gallons of Fuel		MPG
Baseline (Pre-poisoning)	- 4223-3544=679	Arco Clear -	21.0*	16.70*
Catalyst Poisoning	- 6402-4223=2179	Leaded -	151.8	14.35
Baseline (Post-poisoning)	- 6848-6402=446	Indolene Clear	44.3	10.07
Total	3304	Total	217.1	
		Overall fuel economy -		15.22

*MPG is based on mileage between 3873 - 4223 as first Arco gas ticket for mileage between 3544 and 3873 was lost.

VEHICLE HISTORY

VEHICLE #2: 1978 Pinto w/TWC - License #823 UJV

Date	Odometer	Activity	Remarks
7/17/79	20,119	Received at ARB	Set to factory specs.
7/24/79	20,126	Prechecked-Preconditioned	
		Baseline Tests (Pre-poisoning tests)	
7/25/79	20,126 20,137	CVS-75-1	Original catalyst Unleaded fuel
7/26/79	20,137 20,161	Installed new catalyst and accumulated 24 miles	Pre-conditioning of new catalyst on unleaded fuel-Driver unidentified
7/30/79	20,161 20,254	Filled tank with 4.0 gals Arco Clear - accumulated 93 miles	Drive #1-unleaded fuel (Arco Clear) Moldenhauer
7/30/79	20,254 20,344	Accumulated 90 miles	Drive #2 - unleaded fuel (Arco Clear) Jack Marshall
7/31/79	20,344 20,436	Filled tank with 8.2 gals of Arco Clear - accumulated 92 miles	Drive #3-unleaded fuel (Arco Clear) Jack Marshall
7/31/79	20,436 20,528	Accumulated 91 miles	Drive #4-unleaded fuel (Arco Clear) Jack Marshall
8/01/70	20,528 20,625	Filled tank with 9.0 gals of Arco Clear - accumulated 97 miles	Drive #5-unleaded fuel (Arco Clear) Harold Jackson
8/02/79	20,625 20,632	Pre-conditioning	No record for mileage between 20,632 and 20,637
8/03/79	20,637 20,648	CVS-75-2	1st test with new catalyst-unleaded fuel
8/08/79	20,659 20,666 20,687	Warm-Up TS-1	No record for mileage between 20,648 and 20,659

Vehicle History (continued)

VEHICLE #2: 1978 Pinto w/TWC - License #823 UJV

Date	Odometer	Activity	Remarks
8/13/79	20,687 20,694 20,710	Warm-up TS-2 Filled tank with 10.3 gals. of Indolene Clear	
8/14/79	20,711 20,718	Preconditioned	
8/15/79	20,718 20,729	CVS-75-3	Bypass-unleaded fuel
		Catalyst Poisoning Tests	
8/16/79	20,729 20,745	Installed new catalyst Accumulated 16 miles	
8/17/79	20,745 20,945	Filled tank with 13.0 gals of leaded fuel - accumulated 200 miles	1st tank of leaded fuel Drive #1-Dennis Sandoval
8/20/79	20,945 20,952	Filled tank with 10.2 gals of leaded fuel - preconditioned	2nd tank of leaded fuel
8/20/79	20,952 20,983	TS-3 preconditioned	
8/21/79	20,983 20,994	CVS-75-4	1st CVS on leaded fuel
8/22/79	20,994 21,095	Filled tank with 3.0 gals or leaded fuel - accumulated 101 miles.	Drive #2-leaded fuel Barbara Lowry
8/23/79	21,095 21,190 21,197	Accumulated 95 miles. Filled tank with 9.5 gals of leaded fuel - preconditioned.	Drive #3-leaded fuel-3rd tank-Chris Hagman

Vehicle History (continued)

VEHICLE #2: 1978 Pinto w/TWC - License #823 UJV

Date	Odometer	Activity	Remarks
8/24/79	21,197 21,208	CVS-75-5	2nd CVS on leaded fuel
8/27/79	21,208 21,215 21,231	Warm-up TS-4	
8/28/79	21,231 21,357	Filled tank with 2.7 gals of leaded fuel - accumulated 126 miles	Drive #4-leaded fuel Troy Jemetz
8/29/79	21,357 21,446 21,453	Accumulated 89 miles. Filled tank with 10.3 gals of leaded fuel - preconditioned	Drive #5-leaded fuel 4th tank-Richard Byrd
8/30/79	21,453 21,464	CVS-75-6	3rd CVS on leaded fuel
8/30/79	21,464 21,483	TS-5	
8/31/79	21,483 21,683	Filled tank with 2.5 gals of leaded fuel - accumulated 200 miles	Drive #6-leaded fuel Martin Cvjetkovic
9/04/79	21,683 21,690	Filled tank with 11.3 gals of leaded fuel - preconditioned	62.5 gals total leaded fuel
9/07/79	21,690 21,701	CVS-75-7	4th CVS on leaded fuel higher CO than expected
9/11/79	21,701 21,709 21,730	Warm-Up TS-6	Last test with leaded fuel

Vehicle History (continued)

VEHICLE #2: 1978 Pinto w/TWC - License #823 UJV

Date	Odometer	Activity	Remarks
		Baseline Tests (Post-poisoning tests)	
9/13/79	21,730 21,740	Filled tank with 13.4 gals of of Indolene Clear-Preconditioned	
9/18/79	21,740 21,751	CVS-75-8	Indolene Clear fuel
9/19/79	21,754 21,761	Preconditioned	
9/20/79	21,761 21,772	CVS-75-9	New O_2 sensor-Indolene Clear fuel
9/21/79	21,776 21,925	Filled tank with 3.0 gals of Indolene Clear-Accumulated 149 miles	Drive #7-Indolene Clear Harold Jackson
9/24/79	21,925 21,975	Accumulated 50 miles. Filled tank with 11.7 gals of Indolene Clear-Preconditioned	Drive #8-Indolene Clear Ernie Trejo
9/25/79	21,989 22,000	CVS-75-10	Bypass-unleaded fuel
9/25/79	22,000 22,010 22,039	Warm-Up TS-7	
9/27/79	22,039 22,046	Reinstalled original catalyst & preconditioned	
9/28/79	22,046 22,057	CVS-75-11	Final test.

Vehicle History (continued)

VEHICLE #2: 1978 Pinto w/TWC - License #823 UJV

Date	Odometer	Activity	Remarks
10/02/79	22,057 22,060	Emission check at MVIP	Passed
10/09/79	22,101	Returned vehicle to Rental Agency at LAX.	

	Total Miles	Total Gallons of Fuel		MPG
Baseline (Pre-poisoning)	20729-20119=610	Arco Clear	- 21.2	19.36*
Catalyst Poisoning	21730-20745=985	Leaded	- 62.5	15.76
Baseline (Post-poisoning)	22101-21730=371	Indolene Clear	- 29.4	19.42**
		Total	113.1	
	22101-20119=1982	Overall fuel economy -		17.52

*Based on 21.2 gals of Arco Clear + 10.3 gals. of Indolene Clear
**Based on 19.1 gals of Indolene Clear

VEHICLE HISTORY

VEHICLE #3: 1978 Pinto w/TWC - License 748 UZY

Date	Odometer	Activity	Remarks
7/16/79	16203	Received at ARB for Project 2Q79C1	Prechecked and set to factory specs.
7/20/79	16575	Completed Project 2Q79C1	No charge to EPA for vehicle or gasoline from 7/16 - 7/20/79
7/24/79	16575 16582	Preconditioned	
		Baseline Tests (pre-poisoning)	
7/25/79	16582 16593	CVS-75-1	Original catalyst Unleaded fuel
	16593 16657	Installed new catalyst and Accumulated 64 miles	Preconditioning of new catalyst Unleaded fuel - unidentified driver
7/30/79	16657 16752	Filled tank with 11.8 gals of Arco Clear-Accumulated 95 miles	Drive #1 - Unleaded fuel (Arco Clear) Jack Marshall
7/30/79	16752 16845	Accumulated 93 miles	Drive #2 - Unleaded fuel (Arco Clear) J. Robertson
7/31/79	16845 16941	Filled tank with 8.9 gals of Arco Clear - Accumulated 96 miles	Drive #3 - Unleaded fuel (Arco Clear) R. Byrd
9/1/79	16957 17061	Accumulated 122 miles	(16941-16957 - mileage unaccounted for) Drive #4 Dennis Sandoval
8/2/79	17063 17158	Filled tank with 10.5 gals of Arco Clear - Accumulated 95 miles	Drive #5 Karl Moldenhauer
8/3/79	17158 17172	Accumulated 7 miles and Preconditioned	Unscheduled drive D. Sandoval
8/3/79	17172 17183	CVS-75-2	1st test - new catalyst - unleaded fuel
8/8/79	17183 17191 17213	Warm-up TS-1	

VEHICLE HISTORY (Continued)

VEHICLE #3: 1978 Pinto w/TWC - License 748 UZY

Date	Odometer	Activity	Remarks
8/14/79	17213	Warm-up	Bypass - unleaded fuel
	17220	TS-2	
	17244	Precondition	
8/15/79	17251 17262	CVS-75-3	
		Catalyst Poisoning	
8/17/79	17264 17471	Filled tank with 12.8 gals of leaded fuel - Accumulated 207 miles	1st tank of leaded fuel Drive #1 Eric Yates
8/20/79	17471	Filled tank with 9.0 gals of leaded fuel	2nd tank of leaded fuel
8/20/79	17471 17478 17502	Warm-up TS-3	
8/21/79	17502 17513	CVS-75-4	1st CVS on leaded fuel
8/24/79	17517 17532	Filled tank with 3.2 gals. of leaded fuel - Accumulated 15 miles	17513 - 17517 (mileage unaccounted for) Drive #2 Fred Burriell
8/27/79	17532 17622	Accumulated 90 miles	Drive #3 leaded fuel Chris Hagman
8/27/79	17622 17747	Accumulated 125 miles - Filled tank with 12.0 gals of leaded fuel	2nd tank of leaded fuel Drive #4 Eric Yates
8/28/79	17747 17758	CVS-75-5	2nd CVS on leaded fuel
8/28/79	17758 17780	TS-4	
8/30/79	17780 17878	Filled tank with 2.0 gals of leaded fuel - Accumulated 108 miles	Drive #5 leaded fuel Fred Burriell

VEHICLE HISTORY (Continued)

VEHICLE #3: 1978 Pinto w/TWC - License 748 UZY

Date	Odometer	Activity	Remarks
8/30/79	17878 17978	Accumulated 100 miles	Drive #6 leaded fuel Barbara Lowry
8/30/79	17978 17988	Preconditioned	
8/31/79	17988 17999	CVS-75-6	3rd CVS on leaded fuel
8/31/79	17999 18017	TS-5	
9/5/79	18017 18116	Filled tank with 7.3 gals of leaded fuel - Accumulated 99 miles	Drive #7 leaded fuel - 4th tank Dennis Sandoval
9/11/79	18116 18234 18242	Accumulated 118 miles, Filled with 10.3 gals of leaded fuel Preconditioned	Drive #8 leaded fuel - 4th tank Ed Huntley
9/12/79	18242 18253	CVS-75-7	4th CVS on leaded fuel
9/12/79	18253 18274	TS-6	last test on leaded fuel
		Baseline-Tests (Post-poisoning)	
9/14/79	18274	Filled tank with 13.5 gals of Indolene Clear	
9/17/79	18274 18284	Preconditioning	
9/18/79	18284 18295	CVS-75-8	unleaded fuel
9/20/79	18298 18305	Installed new O_2sensor Preconditioned	
9/20/79	18305 18316	CVS-75-9	unleaded fuel New O_2 sensor

VEHICLE HISTORY (Continued)

VEHICLE #3: 1978 Pinto w/TWC - License 748 UZY

Date	Odometer	Activity	Remarks
9/21/79	18316 18467	Filled tank with 2.4 gals. of Indolene Clear - Accumulated 153 miles	Drive #9 - unleaded fuel Jack Marshall
9/24/79	18469 18519	Accumulated 50 miles Filled tank with 11.1 gals of Indolene Clear	Drive #10 - unleaded fuel Eric Yates
9/24/79	18519 18526 18558	Warm-up TS-7 Precondition	Aborted - sample leak
9/25/79	18558 18569 18575	CVS-75-10 Preconditioned	New O_2 sensor - bypass Aborted - sample leak
9/26/79	18575 18586	CVS-75-11	Repeat - unleaded fuel
9/26/79	18586 18608 18615	TS-8 Preconditioned	Bypass - unleaded fuel
10/2/79	18615 18626	CVS-75-12	
10/3/79	18626 18681	Accumulated 55 miles. Filled tank with 8.7 gals. of Indolene Clear	Drive #11 - unleaded fuel Dennis Sandoval
10/3/79	18681 18731	Accumulated 50 miles	Drive #12 - unleaded fuel Ernie Trejo
10/3/79	18731 18781 18788	Accumulated 50 miles Preconditoned	Drive #13 - unleaded fuel K. Moldenhauer
10/4/79	18788 18798	CVS-75-13	
10/5/79	18798 18822	MVIP station inspection	passed

VEHICLE HISTORY (Continued)

VEHICLE #3: 1978 Pinto w/TWC - License 748 UZY

Date	Odometer	Activity	Remarks
10/5/79	18822 18922	Filled tank with 8.8 gals of Indolene Clear - Accumulated 100 miles	Drive #14 - unleaded fuel Karl Moldenhauer
10/9/79	18922 18929	Preconditioned	
10/10/79	18929 18940	CVS-75-14	repeat - last EPA test - ARB program continuing

Total Miles		Total gallons of fuel		MPG
Baseline (Pre-poisoning) - 17262 - 16575 =	687	Arco Clear	- 31.2	22.01
Catalyst poisoning - 18274 - 17262 =	1012	Leaded	- 56.6	17.87
Baseline (Post-poisoning)- 18940 - 18274 =	666	Indolene Clear	- 44.5	14.98
Total =	2365	Total	-132.3	
		Overall Fuel Economy		17.88

VEHICLE HISTORY

VEHICLE #4: 1979 Granada - License 406 WDO

Date	Odometer	Activity	Remarks
7/20/79	10414 10426	Received at ARB Prechecked	Set to factory specs
		Baseline Tests (Pre-poisoning tests)	
7/24/79	10426 10433	Preconditioned	
7/25/79	10433 10444	CVS-75-1	Original Catalyst - unleaded fuel
7/26/79	10444 10460	Installed new catalyst - Accumulated 14 miles	preconditioning new catalyst - unleaded fuel
7/26/79	10460 10548	Filled tank with 16 gals at Arco Clear - Accumulated 88 miles	Drive #1 - unleaded fuel (Arco Clear) Robertson
7/27/79	10548 10643	Accumulated 95 miles - Filled tank with 11.4 gals Arco Clear	Drive #2 - unleaded fuel (Arco Clear) Ed Colston
7/27/79	10643 10738	Accumulated 95 miles	Drive #3 - unleaded fuel (Arco Clear) Moldenhauer
7/27/79	10738 10831	Accumulated 93 miles Filled tank with 5.4 gals	Drive #4 - unleaded fuel (Arco Clear) Frank Cornick
7/30/79	10831 10928	Accumulated 97 miles	Drive #5 - unleaded fuel (Arco Clear) H. Jackson
7/31/79	10928 10959	Accumulated 21 miles and preconditioned	Driver unknown
8/01/79	10959 10970	CVS-75-2	1st CVS with new catalyst - unleaded fuel
8/07/79	10970 10991 11017	Warm-up TS-1	
8/13/79	11017 11024 11047	Warm-up TS-2-Filled tank with 18 gals. of unleaded fuel at 11041 miles.	Bypass - unleaded fuel
8/14/79	11047 11054	Preconditioned	

VEHICLE HISTORY (continued)

VEHICLE #4: 1979 Granada - License 406 WDO

Date	Odometer	Activity	Remarks
8/15/79	11054 11065	CVS-75-3	Bypass - unleaded fuel
		Catalyst Poisoning Tests	
8/17/79	11068 11276	Filled tank with 18.0 gals of leaded fuel - Accumulated 208 miles	1st tank of leaded fuel Drive #1 Fred Burriell
8/20/79	11276 11284	Filled tank with 11.3 gals of leaded fuel - Preconditioned	2nd tank of leaded fuel
8/21/79	11284 11295	CVS-75-4	1st CVS on leaded fuel
8/21/79	11296 11312	TS-3	
8/22/79	11312 11418	Filled tank with 4.0 gals of leaded fuel - Accumulated 106 miles	Drive #2-leaded fuel Frank Cornick
8/23/79	11418 11512	Accumulated 94 miles	Drive #3-leaded fuel John Kowalski
8/23/79	11512 11519	Filled tank with 9.3 gals of leaded fuel - preconditioned	3rd tank of leaded fuel
8/24/79	11519 11530	CVS-75-5	2nd CVS on leaded fuel
8/24/79	11530 11534 11557	Warm-up TS-4	
8/27/79	11557 11627	Filled tank with 4.8 gals of leaded fuel - Accumulated 70 miles	Drive #4-leaded fuel Fred Burriel
8/29/79	11627 11762 11770	Accumulated 135 miles. Filled tank with 11.6 gals of leaded fuel - Preconditioned	Drive #5-leaded fuel - 4th tank Bill Gertig
8/30/79	11770 11781	CVS-75-6	3rd CVS on leaded fuel
8/30/79	11781 11796	TS-5	

VEHICLE HISTORY (Continued)

VEHICLE #4: 1979 Granada - License 406 WDO

Date	Odometer	Activity	Remarks
9/5/79	11796 11890	Topped tank with 1.4 gals of leaded fuel - Accumulated 94 miles	Drive #6-leaded fuel Richard Byrd
9/5/79	11890 11989	Accumulated 99 miles. Filled tank with 11.6 gals of leaded fuel	Drive #7-leaded fuel - 5th tank Eric Yates
9/11/79	11989 11996 12026	Warm-up TS-6 Precondition	
9/12/79	12026 12037	CVS-75-7	4th and last CVS on leaded fuel
		Baseline Tests (Post-poisoning tests)	
9/13/79	12038	Filled tank with 18.5 gallons of Indolene Clear - Preconditioned	
9/14/79	12049 12060	CVS-75-8	Unleaded fuel
9/18/79	12060 12071 12094 12101	Warm-up TS-7 Precondition	Bypass
9/19/79	12101 12112	CVS-75-9	Bypass-unleaded fuel
9/25/79	12112 12124	Reinstalled original catalyst and Preconditioned	
9/26/79	12124 12135	CVS-75-10	Original Catalyst HC emissions high
9/27/79	12136 12191 12198	Installed new plugs and accumulated 55 miles Preconditioned	Drive #8-unleaded fuel Martin Cvjetkovic
9/28/79	12198 12209	CVS-75-11	Repeat

VEHICLE HISTORY (continued)

VEHICLE #4: 1979 Granada - License 406 WDO

Date	Odometer	Activity	Remarks
10/1/79	12209	Warm-up	Split Bag (diagnostic)
	12226	HCVS-72 - Preconditioning	
10/2/79	12226	CVS-75-12	
	12237		
10/3/79	12237	Filled tank with 14.0 gals of Indolene Clear	Drive #9-unleaded fuel Richard Byrd
	12341	Accumulated 104 miles	
10/3/79	12341	Accumulated 50 miles	Drive #10-unleaded fuel Ernie Trejo
	12391	Preconditioned	
	12398		
10/4/79	12398	CVS-75-13	Final
	12409		
10/9/79	12409	Returned to Rental Agency	
	12420		

Total Miles

Baseline (Pre-poisoning tests-11065-10414 = 651
Catalyst poisoning tests -12037-11065 = 972
Base (Post-poisoning tests) -12420-12037 = 383

TOTAL 2,006

	Total Gallons of Fuel	MPG
Arco Clear	32.8	12.81*
Leaded	72.0	13.50
Indolene Clear	50.5	11.78**
	155.3	

Overall fuel economy = 12.92

*Mileage based on 32.8 gals. of Arco + 18.0 of gals. of Indolene Clear.
**Mileage based on 32.5 gals. of Indolene Clear.

Vehicle History

VEHICLE #5 : 1979 Ford Futura - License 684VZF

Date	Odometer	Activity	Remarks
7/18/79	20041 20076	Received at ARB Prechecked-Preconditioned	Set to factory specs.
7/24/79	20076 20083	Preconditioned	
		Baseline Tests (Pre-poisoning)	
7/25/79	20083 20094	CVS-75-1	Baseline CVS-Original Catalyst Unleaded Fuel
7/26/79		Installed new catalyst assigned drivers for 500 mile preconditioning	
7/26/79	20095 20196	Accumulated 101 miles. Filled tank with 8.3 gals Arco Clear	Drive #1 - Unleaded fuel J. Robertson
7/27/79	20196 20290	Accumulated 93 miles. Filled tank with 5.6 gals Arco Clear	Drive #2 - Unleaded fuel J. Marshall
7/27/79	20290 20385	Accumulated 95 miles. Filled tank with 5.6 gals Arco Clear	Drive #3 - Unleaded fuel E. Colston
7/27/79	20385 20476	Accumulated 91 miles. Filled tank with 4.9 gals Arco Clear	Drive #4 - Unleaded fuel B. Lowry
7/30/79	20476 20571	Accumulated 95 miles	Drive #5 - Unleaded fuel D. Sandoval
7/31/79	20571 20607	Added 4.0 gals Indolene Clear Preconditioned	
8/02/79	20607 20618	CVS-75-2	Baseline CVS-new catalyst after 524 mile preconditioning
8/07/79	20618 20637 20665	Accumulated 19 miles TS1	Unscheduled - Driver unknown
8/08/79	20665	Filled tank with 6.0 gals of Indolene Clear	

Vehicle History

VEHICLE #5 : 1979 Ford Futura - License 684VZF

Date	Odometer	Activity	Remarks
8/13/79	20665 20670 20695	Warm-up TS2	Bypass-unleaded fuel
8/16/79	20708 20715	Precondition	20695-20708-unaccounted for
8/17/79	20715 20726	CVS-75-3	Bypass
		Catalyst Poisoning	
8/20/79	20733	Filled tank with 17.0 gals of leaded fuel	20726-20733-Unaccounted for 1st tank of leaded fuel
8/20/79	20733 20833	Accumulated 100 miles	2nd tank of leaded fuel Drive #1 - Frank Cornick
8/21/79	20833 20926 20934	Accumulated 93 miles. Filled tank with 11.4 gals of leaded fuel Preconditioned	Drive #2 - leaded fuel Richard Byrd
8/22/79	20934 90945	CVS-75-4	1st CVS on leaded fuel
8/22/79	20945 20962	TS3	
8/27/79	20962 21064	Filled tank with 3.4 gals of leaded fuel-Accumulated 102 miles	Drive #3 - leaded fuel C. Uyemura
8/28/79	21064 21166 21174	Accumulated 102 miles. Filled tank with 12.0 gals of leaded fuel-Preconditioned	Drive #4 - leaded fuel John Cansler
8/29/79	21174 21185	CVS-75-5	2nd CVS on leaded fuel
8/29/79	21185 21201	TS4	
8/30/79	21201 21302	filled tank with 2.8 gals of leaded fuel-Accumulated 101 miles	Drive #5 - leaded fuel Fred Burriell

Vehicle History

VEHICLE #5 : 1979 Ford Futura - License 684VZF

Date	Odometer	Activity	Remarks
		Catalyst Poisoning	
8/31/79	21302 21397	Accumulated 95 miles. Filled tank with 12.4 gals of leaded fuel	4th tank of leaded fuel
9/5/79	21397 21404	Preconditioned	
9/6/79	21404 21415	CVS-75-6	3rd CVS on leaded fuel
9/6/79	21415 21434	TS5	
		Baseline Tests (Post-poisoning)	
9/13/79	21434 21445	Filled tank with 16.8 gals of Indolene Clear. Preconditioned.	
9/14/79	21445 21456	CVS-75-7	
9/18/79	21456 21477	Installed bypass and Preconditioned	
9/19/79	21477 21488	CVS-75-8	Bypass-unleaded fuel
9/19/79	21488 21517	TS6	Bypass-unleaded fuel
9/25/79	21517 21524	Installed original catalyst and preconditioned.	
9/26/79	21524 21535	CVS-75-9	Unleaded fuel
9/26/79	21535 21584	Accumulated 49 miles	Driver unknown 50 mile accumulation
9/27/79	21584 21591	Precondition	
9/28/79	21591 21602	CVS-75-10	Unleaded fuel Repeat after 50 miles
10/1/79	21602 21611 21625	TS-10 Filled tank with 13.7 gals unleaded. Completed TS-10	New plugs - split bag

Vehicle History

VEHICLE #5 : 1979 Ford Futura - License 684VZF

Date	Odometer	Activity	Remarks
		Baseline Tests (Post-poisoning)	
10/2/79	21625 21636	CVS-75-11	
10/2/79	21636 21752	Accumulated 116 miles	Drive #7 Unleaded fuel & upper cylinder cleaner - Ed Huntley.
10/3/79	21752 21822 21829	Accumulated 70 miles Preconditioned	Drive #8 Dennis Sandoval
10/4/79	21829 21840	CVS-75-12	HC still above standards after 200 miles - End of EPA program-vehicle retained for continuation under ARB program

Total Miles		
Baseline (Pre-poisoning)	- 20733 - 20041 =	692
Catalyst poisoning	- 21434 - 20733 =	701
Baseline (Post-poisoning)	- 21840 - 21434 =	406
	Total	1799

Total Gallons of fuel		MPG
Arco Clear	- 24.4	20.11*
Leaded	- 59.0	11.88
Indolene Clear	- 40.5	13.31**
Total	123.9	

Overall fuel economy - 14.52

*Based on 24.4 gals of Arco Clear +10.0 gals of Indolene Clear.
**Based on 30.5 gals of Indolene Clear.

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro - License 291 XJR

Date	Odometer	Activity	Remarks
7/23/79	3078 3094	Received at ARB Prechecked-Preconditioned	Set to factory specs.
7/24/79	3094 3101	Preconditioned	
		Baseline (Pre-poisoning tests)	
7/25/79	3101 3112	CVS-75-1	Test with original catalyst unleaded fuel
7/26/79	3114 3314	Installed new catalyst and accumulated 200 miles	Drive #1 - unleaded fuel Maury Fleming
7/27/79	3314 3406	Filled tank with 8.0 gals. of Arco Clear-Accumulated 95 miles	Drive #2 - unleaded fuel H. Leuschner
7/27/79	3406 3501	Filled tank with 5.9 gals. of Arco Clear-Accumulated 95 miles	Drive #3 - unleaded fuel J. Robertson
7/27/79	3501 3601	Accumulated 100 miles. Filled tank with 12.8 gals. of Arco Clear	Drive #4 - unleaded fuel J. Marshall
7/30/79	3601 3695	Accumulated 94 miles	Drive #5 - unleaded fuel R. Byrd
7/31/79	3695 3709	Filled tank with 8.0 gals. of Indolene Clear - Preconditioned	
8/01/79	3709 3720	CVS-75-2	1st CVS test on new catalyst - unleaded fuel
8/06/79	3720 3737 3771	Accumulated 17 miles TS-1	
8/10/79	3771 3778 3800	Warm-up TS-2	Bypass
8/13/79	3800 3807	Preconditioned	

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro - License 291 XJR

Date	Odometer	Activity	Remarks
8/14/79	3807 3818	CVS-75-3	Bypass
8/14/79	3818 3826	Accumulated 8 miles	Driver unknown
		Catalyst Poisoning	
8/15/79	3826 3840	Filled tank with 19.7 gals. leaded fuel-Preconditioned	1st tank of leaded fuel
8/16/79	3840 3848	CVS-75-4 (aborted)	
8/16/79	3848 3876	TS-3	
8/17/79	3876 3887	CVS-75-5	1st CVS on leaded fuel (Repeat)
8/20/79	3887 3898	CVS-75-6	2nd CVS on leaded fuel (Repeat)
8/21/79	3898 4006	Filled tank with 8.0 gals. of leaded fuel - Accumulated 108 miles.	Drive #1 - leaded fuel C. Uyemura
8/22/79	4006 4093 4100	Accumulated 87 miles. Filled tank with 15.0 gals. of leaded fuel. Preconditioned	Drive #2 - leaded fuel Fred Burriell
8/23/79	4100 4111	CVS-75-7	Leaded fuel
8/23/79	4111 4126	TS-4	
8/24/79	4126 4325	Filled tank with 3.5 gals. of leaded fuel-Accumulated 199 miles.	Drive #3 - leaded fuel Martin Cvjetkovic
8/27/79	4325	Filled tank with 15.0 gals. of leaded fuel.	

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro - License 298 XJR

Date	Odometer	Activity	Remarks
8/28/79	4325 4332	Preconditioned	
8/29/79	4332 4343	CVS-75-8	leaded fuel
8/29/79	4343 4360	TS-5	
8/30/79	4360 4464	Filled tank with 3.5 gals. of leaded fuel-Accumulated 104 miles	Drive #4 - leaded fuel Bob Weis
8/31/79	4464 4551	Accumulated 87 miles. Filled tank with 14.3 gals. of leaded fuel	Drive #5 - leaded fuel Eric Yates
9/6/79	4551 4558	Preconditioned	
9/7/79	4558 4569	CVS-75-9	leaded fuel
9/7/79	4569 4588	TS-6	
9/12/79	4588 4684	Accumulated 96 miles.	Drive #6 - leaded fuel Richard Byrd
9/12/79	4684 4778 4788	Accumulated 94 miles. Filled tank with 18.0 gals. of leaded fuel. Preconditioned.	Drive #7 - leaded fuel Dennis Sandoval
9/13/79	4788 4799	CVS-75-10	leaded fuel
9/13/79	4799 4817	TS-7	
9/17/79	4817 4907	Filled tank with 3.5 gals. of leaded fuel. Accumulated 90 miles.	Drive #8 - leaded fuel Jack Marshall

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro Z-28 - License 291 XJR

Date	Odometer	Activity	Remarks
9/18/79	4907 5012 5035	Accumulated 105 miles. Filled tank with 14.5 gals. of leaded fuel. Accumulated 23 miles.	Drive #9 - leaded fuel Ernie Trejo
9/18/79	5035 5057	TS-8	
9/19/79	5057 5068	CVS-75-11	leaded fuel
9/20/79	5073 5134	Filled tank with 5.9 gals. of leaded fuel-Accumulated 61 miles.	Drive #10 - leaded fuel Eric Yates (5068-5073-unaccounted for)
9/20/79	5134 5269 5277	Accumulated 135 miles. Preconditioned	Drive #11 - leaded fuel Moldenhauer
9/20/79	5277 5288	CVS-75-12	leaded fuel
9/21/79	5288 5302	TS-9	
9/25/79	5302 5401	Filled tank with 17.5 gals. of leaded fuel-Accumulated 98 miles.	Drive #12 - leaded fuel (Driver not recorded)
9/25/79	5401 5496 5502	Accumulated 95 miles. Preconditioned	Drive #13 - leaded fuel Moldenhauer
9/26/79	5502 5513	CVS-75-13	leaded fuel
9/26/79	5513 5528	Accumulated 15 miles.	Driver unknown

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro Z-28 - License 291 XJR

Date	Odometer	Activity	Remarks
		Baseline Tests (Post-poisoning)	
9/28/79	5528 5553	Put 2.0 gals. of Indolene Clear in tank- Accumulated 25 miles. Filled tank with 20 gallons of Indolene Clear	Unleaded fuel
10/1/79	5553 5561	Preconditioned	
10/2/79	5561 5572	CVS-75-14	Unleaded fuel
10/5/79	5572 5589 5600	Warm-up TS-11	 Bypass
10/9/79	5600 5607	Preconditioned	
10/10/79	5607 5618	CVS-75-15	Bypass-Unleaded fuel
10/11/79	5618 5778 5785	Filled tank with 6.0 gals. of Indolene-Accumulated 160 miles. Reinstalled original catalyst & preconditioned.	Drive #14 - unleaded fuel Fred Burriell - K. Moldenhauer
10/12/79	5785 5796	CVS-75-16	Unleaded fuel
10/15/79	5796 5809	Preconditioned	
10/16/79	5809 5816	CVS-75-17	Unleaded fuel
10/17/79	5816 5833	Returned vehicle to Budget Rent-a-Car	

VEHICLE HISTORY

VEHICLE #6: 1979 Camaro Z-28 - License 291 XJR

Total Miles	Total Gallons of Fuel		MPG
Baseline (Pre-poisoning) 3826 - 3807 = 748	Arco Clear	- 26.7	21.56*
Catalyst Poisoning 5528 - 3826 = 1702	Leaded	138.3	12.30
Baseline (Post-poisoning) 5833 - 5528 = 305	Indolene Clear	36.0	10.89**
Total 2755		193.0	
	overall fuel economy =		14.27

*Based on 26.7 gals. of Arco Clear + 8.0 gals. of Indolene Clear

**Based on 28 gals. of Indolene Clear

VEHICLE HISTORY

VEHICLE #7*: 1979 Malibu - License 253 XTR

Date	Odometer	Activity	Remarks
7/26/79	1275	Received at ARB Prechecked	Set to factory specs Preconditioned for 50 miles
8/02/79	1325 1330	Preconditioned	Due to low mileage, original catalyst was left on.

Baseline Tests (Pre-poisoning tests)

Date	Odometer	Activity	Remarks
8/03/79	1330 1341	CVS-75 - 1	Baseline
8/14/76	1341 1349 1362	Warm-up TS-1	
8/15/79	1362 1369	Filled tank with 13.5 gals of Indolene Clear - Preconditioned	
8/16/79	1369 1380	CVS-75 - 2	2nd CVS on leaded fuel
8/21/79	1380 1391 1398	Accumulated 11 miles Preconditioned	Driver unknown
8/22/79	1398 1409	CVS-75 - 3	3rd CVS on unleaded fuel (Bypass)
8/22/79	1409 1430	TS-2	
8/23/79	1430 1441	CVS-75 - 4	4th CVS on unleaded fuel-Bypass

Vehicle History (Continued)

VEHICLE #7*: 1979 Malibu - License 253 XTR

Date	Odometer	Activity	Remarks
		Catalyst Poisoning Tests	
8/24/79	1441 1642	Filled tank with 17.5 gals of leaded fuel - Accumulated 201 miles	1st tank of leaded fuel Drive #1 Eric Yates
8/27/79	1642 1650	Filled tank with 9.0 gals of leaded fuel - Preconditioned	2nd tank of leaded fuel
8/28/79	1650 1661	CVS-75 - 5	5th CVS - First test on leaded fuel
8/28/79	1661 1675	TS-3	
8/30/79	1675 1839	Filled tank with 3.5 gals of leaded fuel - Accumulated 164 miles	Drive #2 leaded fuel Bill Gertig
8/31/79	1839 1872	Accumulated 33 miles filled tank with 10.2 gals of leaded fuel	Drive #3 leaded fuel - 3rd tank Fred Burriell
9/4/79	1872 1880 1901	Warm-up TS-4	
9/5/79	1901 1912	CVS-75 - 6	6th CVS - leaded fuel
9/5/79	1912 2003	Filled tank with 3.0 gals of leaded fuel - Accumulated 91 miles	Drive #4 leaded fuel Richard Byrd
9/6/79	2003 2108 2115	Filled tank with 10.0 gals. of leaded fuel - Accumulated 105 miles Preconditioned	4th tank of leaded fuel Drive #5 Eric Yates

Vehicle History (Continued)

VEHICLE #7*: 1979 Malibu - License 253 XTR

Date	Odometer	Activity	Remarks
9/7/79	2115 2126	CVS-75 - 7	7th CVS - leaded fuel
9/7/79	2126 2148	TS-5	
9/11/78	2148 2224	Accumulated 200 miles	Drive #6 leaded fuel Paul Hughes
9/12/79	2224 2348 2359	Accumulated 124 miles. Filled tank with 14.0 gals of leaded fuel preconditioned	Drive #7 Eric Yates 5th tank of leaded fuel
9/13/79	2359 2370	CVS-75 - 8	8th CVS - leaded fuel
9/13/79	2370 2382	TS-6	
		Baseline Tests (Post-poisoning tests)	
9/18/79	2382 2388	Filled tank with 18.7 gals of Indolene Clear - Preconditioned	
9/19/79	2391 2402	CVS-75 - 9	Unleaded fuel
9/24/79	2402 2413	Precondition	Unleaded fuel
9/25/79	2413 2424	CVS-75 - 10	Unleaded fuel

Vehicle History (Continued)

VEHICLE #7*: 1979 Malibu - License 253 XTR

Date	Odometer	Activity	Remarks
	2424 2629	Accumulated 205 miles	With original O_2 sensor Drive #8 Moldenhauer-Trejo
9/27/79	2630 2641	Filled tank with 14.0 gals. of Indolene Clear - Accumulated 11 miles	Driver unknown
9/28/79	2641 2658	TS-7	Bypass
10/1/79	2658 2665	Preconditioned	
10/2/79	2665 2676	CVS-75 - 11	11th CVS test - Bypass
10/3/79	2676 2684	Installed new catalyst and preconditioned.	
10/4/79	2684 2695	CVS-75 - 12	Final CVS -Reinstalled new O_2 sensor (originally installed at 2413 miles.
10/9/79	2695 2735	Returned vehicle to G.M. in Van Nuys - Returned rented Monte Carlo 696WCU (loaned to GM) to Rental Agency	Total mileage accumulated on rental car - 231

Total Mileages		Total Gallons of Fuel		MPG
Baseline (Pre-poisoning)	1441-1275=166	Indolene Clear	-13.5	12.30
Catalyst Poisoning	2348-1441=907	Leaded	-67.2	13.49
Baseline (Post-poisoning)	2630-2382=248	Indolene Clear	-32.7	7.58
		Total	113.4	
	2695-1275=1420	Overall fuel economy -		12.52

*Rental Car (Monte Carlo 696 WCU) was loaned to G.M. Van Nuys in exchange for the use of vehicle #7.

VEHICLE HISTORY

VEHICLE #8: 1979 Pontiac Sunbird - License 813 WWU

Date	Odometer	Activity	Remarks
8/2/79	4667	Received at ARB Prechecked	Set to factory spec.
8/6/79	4667 4677	Filled tank with 8.5 gals. of Indolene Clear-Preconditioned	
		Baseline Tests (Pre-poisoning)	
8/7/79	4677 4688	CVS-75-1	1st CVS-original catalyst-HC/CO emissions high-sent to GM for repairs.
8/9/79	4688 4770	To G.M. Van Nuys for repairs and return.	GM did complete diagnosis but did not find any problem
8/9/79	4770 4777	Preconditioning	
8/10/79	4777 4788	CVS-75-2	1st CVS after diagnostic evaluation at GM - original catalyst - unleaded fuel. Emissions within standards.
8/15/79	4788 4795 4812	Warm-up TS-1	
8/16/79	4812 4823	CVS-75-3	Baseline CVS - Due to low mileage, original catalyst is considered new - unleaded fuel.
8/21/79	4823 4844	Accumulated 14 miles plus 7 miles preconditioning	Installed Bypass
8/22/79	4844 4855	CVS-75-4	Bypass
8/22/79	4856 4871	TS-2	Bypass

VEHICLE HISTORY (continued)

VEHICLE #8: 1979 Pontiac Sunbird - License 813 WWU

Date	Odometer	Activity	Remarks
		Catalyst Poisoning	
8/23/79	4871 4969	Filled tank with 19.0 gals. of leaded fuel-Accumulated 99 miles.	Drive #1 - 1st tank of leaded fuel Uyemura/Yamamoto
8/24/79	4969 5077	Accumulated 108 miles	Drive #2 - leaded fuel Sandoval
8/24/79	5077	Filled tank with 8.2 gals. of leaded fuel.	2nd tank of leaded fuel
8/27/79	5077 5085	Preconditioning	
8/28/79	5085 5096	CVS-75-5	1st CVS - leaded fuel O_2 sensor bad-intermittent malfunction
8/28/79	5096 5109	TS-3	New O_2 sensor
8/29/79	5109 5116	Preconditioning	
8/30/79	5116 5127	CVS-75-6	2nd CVS - leaded fuel New O_2 sensor
8/30/79	5127 5141	TS-4	
8/31/79	5141 5243	Accumulated 102 miles.	Drive #3 - leaded fuel Neil Ehlinger
8/31/79	5243 5286	Accumulated 43 miles.	Drive #4 - leaded fuel Eric Yates
9/4/79	5286 5344	Accumulated 58 miles.	Drive #5 - leaded fuel Neil Ehlinger
9/4/79	5344 5352 5366	Warm-up TS-4	
9/4/79	5366 5373	Filled tank with 16.4 gals. of leaded fuel - preconditioned	3rd tank of leaded fuel
9/5/79	5373 5384	CVS-75-7	Invalid test

VEHICLE HISTORY (continued)

VEHICLE #8: 1979 Pontiac Sunbird - License 813 WWU

Date	Odometer	Activity	Remarks
9/11/79	5384 5565	Accumulated 181 miles.	Drive #6 - leaded fuel Maury Fleming
9/12/79	5565 5584	Accumulated 19 miles. Filled tank with 8.5 gals. of leaded fuel.	Drive #7 - 4th tank of leaded fuel Dennis Sandoval
9/13/79	5584 5594	CVS-75-8	3rd CVS - leaded fuel
9/13/79	5594 5605 5620	Warm-up TS-6	
9/14/79	5620 5720	Filled tank with 2.2 gals. of leaded fuel - Accumulated 100 miles.	Drive #8 - leaded fuel Bob Weis
9/17/79	5720 5820	Accumulated 100 miles.	Drive #9 - leaded fuel Eric Yates
9/17/79	5820 5836	Accumulated 16 miles.	Driver - unknown
9/17/79	5836 5854 6851	Warm-up TS-7	
9/18/79	5861 5872	CVS-75-9	4th CVS test - leaded fuel
9/19/79	5872 5973	Filled tank with 10.0 gals. of leaded fuel - Accumulated 101 miles.	5th tank of leaded fuel - Drive #10 Eric Yates
9/19/79	5973 6068	Accumulated 95 miles	Drive #11 - leaded fuel Dennis Sandoval
9/19/79	6068 6078	Preconditioning	Test series 8 - leaded fuel
9/20/79	6078 6089	CVS-75-10	5th CVS - leaded fuel
9/20/79	6089 6103	TS-8	

VEHICLE HISTORY (continued)

VEHICLE #8: 1979 Pontiac Sunbird - License 813 WWU

Date	Odometer	Activity	Remarks
		Baseline Tests (Post-poisoning)	
9/24/79	6103 6140	Drained leaded fuel - put in 2.0 gals. of Indolene Clear Accumulated 37 miles.	
9/24/79	6140 6150	Filled tank with 16.7 gals. of Indolene Clear - Preconditioned	
9/25/79	6150 6161	CVS-75-11	
9/26/79	6161 6171	Preconditioned	
9/27/78	6171 6182	CVS-75-12	with new sensor installed on 8/28/79
9/28/79	6182 6387	Accumulated 205 miles.	Drive #12 - Indolene Clear fuel Bypass - Bob Williams
9/28/79	6387	Filled tank with 13.0 gals. of Indolene Clear.	
9/28/79	6387 6396 6409	Warm-up TS-9	Bypass
10/1/79	6409 6416	Preconditioning	
10/2/79	6416 6427	CVS-75-13	Bypass
10/11/79	6427 6577	Accumulated 150 miles (Freeway driving)	Drive #13 - Indolene Clear fuel Cvjetkovic/Cornick
10/24/79	6577 6588 6595	Installed new catalyst Accumulated 11 miles preconditioned	Original catalyst was used for poisoning tests.
10/25/79	6595 6606	CVS-75-14	Final
10/25/79	6606 6610	MVIP Inspection	Possed

Vehicle History

Vehicle #8: 1979 Pontiac Sunbird - License 813 WWU

Date	Odometer	Activity	Remarks
10/26/79	6610	Filled tank with 11.2 gals. of Indolene Clear GM-Van Nuys personnel returned rental vehicle (1979 Camaro 022 X HU) to ARB and picked up the Pontiac Sunbird	

Total Miles		Total Gallons of fuel		MPG
Baseline (pre-poisoning) - 4871 - 4667 =	204	Indolene Clear -	8.5	24,00
Catalyst poisoning - 6103 - 4871 =	1232	Leaded -	64.3	19.16
Baseline (post-poisoning) - 6610 - 6103 =	507	Indolene Clear -	42.9*	11.82*
Total	1943	Total	115.7	
		Overall fuel economy -		16.79

* Based on all fuel put in tank. True mileage should be based on 42.9 - 18.7 = 24.2 gal. which equates to 20.95 MPG.

VEHICLE HISTORY

VEHICLE #9: 1977 Volvo 244DL W/TWC - License 605 WKI

Date	Odometer	Activity	Remarks
8/6/79	26855	Received at ARB Prechecked	Set to factory Specs
8/7/79	26855 26864	Preconditioned	
		Baseline Tests (Pre-poisoning)	
8/8/79	26864 26875	CVS-75-1	Original catalyst
8/9/79	26875 26962	Installed new catalyst - Filled tank with 12.7 gals. of Indolene Clear. Accumulated 87 miles.	Drive #1 - unleaded fuel new catalyst conditioning F. Cornick
8/10/79	26962 27052	Accumulated 90 miles	Drive #2 - unleaded fuel new catalyst conditioning - Chris Hagman
8/10/79	27052 27107	Accumulated 55 miles	Unscheduled drive to Airport & return D Sandoval
8/10/79	27107 27375	Filled tank with 11.0 gals. of Indolene Clear - Accumulated 270 miles	Drive #3 - unleaded fuel B. Lowry
8/13/79	27375	Filled tank with 12.6 gals of Indolene Clear	
8/14/79	27375 27390	Preconditioning	
8/15/79	27390 27401	CVS-75-2	1st test with new catalyst, unleaded fuel
8/16/79	27401 27421	TS-1	
8/20/79	27421 27428	Preconditioned	
8/21/79	27428 27439	CVS-75-3	Bypass
8/21/79	27439 27455	TS-2	

VEHICLE HISTORY (continued)

VEHICLE #9: 1977 Volvo 244 DL W/TWC - License 605 WKI

Date	Odometer	Activity	Remarks
8/22/79	27455 27658	Filled tank with 18.4 gals. of leaded fuel - Accumulated 203 miles	1st tank of leaded fuel Drive #4 - B. Lowry
8/27/79	27658 27665	Filled with 9.2 gals. of leaded fuel - Preconditioned	
8/28/79	27665 27676	CVS-75-4	leaded fuel
8/28/79	27676 27690	TS-3	
8/29/79	27690	Filled tank with 2.8 gals. of leaded fuel	
8/30/79	27690 27838	Accumulated 148 miles	Drive #5 - leaded fuel Eric Yates
8/30/79	27838 27889 27900	Accumulated 51 miles. Filled tank with 9.2 gals. of leaded fuel. Preconditioned	Drive #6 - leaded fuel - 3rd tank Eric Yates
8/31/79	27900 27911	CVS-75-5	leaded fuel
9/7/79	27911 29921 27936	Warm-up TS-4	
9/12/79	27936	Filled tank with 3.7 gals. of leaded fuel.	
9/13/79	27936 28037	Accumulated 101 miles.	Drive #7 - leaded fuel B. Williams
9/14/79	28037 28134	Accumulated 97 miles. Filled tank with 8.8 gals. leaded fuel.	Drive #8 - leaded fuel - 4th tank D. Sandoval
9/17/79	28134 28142	Preconditioned	
9/17/79	28142 28164	TS-5	

VEHICLE HISTORY (continued)

VEHICLE #9: 1977 Volvo 244 DL W/TWC - License 605 WKI

Date	Odometer	Activity	Remarks
9/18/79	28164 28175	CVS-75-6	leaded fuel
9/20/79	28176 28379	Filled tank with 3.0 gals. of leaded fuel. Accumulated 203 miles.	Drive #9 - leaded fuel Eric Yates
9/21/79	28379	Filled tank with 9.7 gals. of leaded fuel.	
9/21/79	28379 28404	TS-6	Test series 6 - leaded fuel
9/23/79	28404 28411	Preconditioning	
9/24/79	28411 28422	CVS-75-7	7th CVS - leaded fuel
9/25/79	28422 28472	Filled tank with 3.2 gals. of leaded fuel - Accumulated 50 miles.	Drive #10 - leaded fuel Fred Burriell
9/25/79	28472 28633	Accumulated 161 miles.	Drive #11 Ernie Trejo
9/26/79	28633 28641 28666	Warm-up TS-7	
9/27/79	28666 28677	CVS-75-8	leaded fuel
9/27/79	28677 28777	Filled tank with 12.8 gals. of leaded fuel. Accumulated 100 miles	Drive #12 - leaded fuel Ernie Trejo
9/27/79	28777 28872	Accumulated 95 miles.	Drive #13 - leaded fuel K. Moldenhauer
9/27/79	28872 28879	Preconditioned	

VEHICLE HISTORY (continued)

VEHICLE #9: 1977 Volvo 244 DL W/TWC - License 605 WKI

Date	Odometer	Activity	Remarks
9/28/79	28879 28890	CVS-75-9	leaded fuel
9/28/79	28890 28902	TS-8	
9/28/79	28902 29009	Filled tank with 11.2 gals. of leaded fuel - Accumulated 107 miles.	Drive #14 - leaded fuel Bob Williams
10/1/79	29009 29109	Accumulated 100 miles. Filled tank with 10.3 gals. of leaded fuel	Drive #15 - leaded fuel - 7th tank Eric Yates
10/1/79	29109 29116 29138	Warm-up TS-9	
10/2/79	29138 29149	CVS-75-10	leaded fuel
10/3/79	29150 29253	Filled tank with 3.2 gals. of leaded fuel - Accumulated 103 miles.	Drive #16 - leaded fuel Ernie Trejo
10/3/79	29253 29299	Accumulated 46 miles	Drive #17 - leaded fuel Eric Yates
10/4/79	29299 29306	Preconditioned	
10/5/79	29306 29317	CVS-75-11	
10/5/79	29317 29328	TS-10	Final test for EPA - ARB test program continuing.
10/5/79 to 11/13/79	29328 29438	No tests Accumulated 110 miles	Power steering repairs at Pasadena and Whittier Volvo dealers.
11/14/79 11/26/79	29438 29576 29583	Filled tank with 17.0 gallons of Indolene Clear. Accumulated 138 miles Preconditioned	
11/27/79	29583 29594	CVS-75	Poisoned new catalyst

VEHICLE HISTORY (continued)

VEHICLE #9: 1977 Volvo 244 DL W/TWC - License 605 WKI

Date	Odometer	Activity	Remarks
11/29/79	29594 29692	Filled tank with 9.2 gallons of Indolene Clear - Accumulated 98 miles	
11/29/79	29692 29698	Preconditioned	
11/30/79	29698	CVS-75	Bypass
12/4/79	29709 29830	Accumulated 121 miles Filled tank with 13.5 gallons of Indolene Clear	
12/11/79	29830 30047	Accumulated 217 miles. Filled tank with 11.6 gals of Indolene Clear	
12/27/79	30047 30302 30451	Accumulated 255 miles Filled tank with 12.7 gals. Indolene Clear Accumulated 149 miles	
1/8/80	30451 30462	CVS-75	New catalyst and new O_2 sensor.

Total Miles			Total Gallons of fuel		MPG
Baseline (Pre-poisoning)	- 27455-26855 =	600	Indolene Clear	- 36.3	16.53
Catalyst poisoning	- 29317-27455 =	1862	Leaded	- 105.5	17.65
Baseline (Post-poisoning)	30462-29328 =	1134	Indolene Clear	- 64.0	17.71
Total		3596		205.8	
			overall fuel economy		17.53

VEHICLE HISTORY

VEHICLE #10: 1977 Volvo w/TWC - License 607 WKI

Date	Odometer	Activity	Remarks
8/6/79	11982	Received at ARB Prechecked	Set to factory specs. Corrected wiring to ignition coil - Polarity reversed
8/7/79	11985 11992	Preconditioned	
		Baseline Tests (Pre-poisoning tests)	
8/08/79	11992 12003	CVS-75 - 1	Original catalyst
8/09/79	12003 12090	Filled tank with 10.9 gals. of Indolene Clear- Accumulated 87 miles	With new catalyst - start of 500 mile preconditioning Drive #1 Sandoval
8/10/79	12090 12165	Accumulated 75 miles- Filled tank with 7.2 gals. of Indolene Clear	Drive #2 Unleaded fuel Gary Skousen
8/10/79	12165 12409	Accumulated 244 miles	Drive #3 Unleaded fuel Fred Burriell
8/13/79	12409 12503	Accumulated 94 miles- Filled tank with 13.9 gals. of Indolene Clear	Drive #4 Unleaded fuel R. Byrd
8/15/79	12503 12510	Preconditioned	
8/16/79	12510 12521	CVS-75 - 2	2nd CVS unleaded fuel
8/16/79	12521 12556	TS-1	

Vehicle History (continued)

VEHICLE #10: 1977 Volvo w/TWC - License 607 WKI

Date	Odometer	Activity	Remarks
8/20/79	12556 12563	Preconditioned	
8/21/79	12563 12574	CVS-75 - 3	3rd CVS Unleaded fuel
8/21/79	12574 12682 12601	Warm-up TS-2	

Catalyst Poisoning Tests

Date	Odometer	Activity	Remarks
8/23/79	[illegible]	Filled tank with 14.0 gals. of leaded fuel	1st tank of leaded fuel
8/24/79	12601 12801	Accumulated 200 miles	Drive #5 Leaded fuel Frank Cornick
8/27/79	12801 12808	Filled tank with 9.4 gals. of leaded fuel - preconditioned	
8/28/79	12808 12819	CVS-75 - 4	4th CVS - leaded fuel
8/28/79	12819 12825 12839	Warm-up TS-3	
8/30/79	12839 12929	Filled tank with 3.0 gals. of leaded fuel - Accumulated 90 miles	Drive #6 - leaded fuel Chris Hagman
8/30/79	12929 12944	Accumulated 15 miles	Drive #7 - leaded fuel Troy Jemetz

Vehicle History (continued)

VEHICLE #10: 1977 Volvo w/TWC - License 607 WKI

Date	Odometer	Activity	Remarks
8/30/79	12944 13039	Accumulated 95 miles	Drive #8 - leaded fuel Frank Cornick
8/30/79	13039 13046	Preconditioned	
8/31/79	13046 13057	CVS-75 - 5	5th CVS leaded fuel
8/31/79	13057 13064 13084	Warm-up	

Baseline Tests (Post-poisoning tests)

Date	Odometer	Activity	Remarks
9/6/79	13084 13095	Filled tank with 15.0 gals. of Indolene Clear- Preconditioned	Reinstalled original catalyst
9/7/79	13095 13106	CVS-75 - 6	6th CVS unleaded fuel original catalyst
9/11/79	13106 13114	Preconditioned	
9/12/79	13114 13125	CVS-75 - 7	7th CVS unleaded fuel new O_2 sensor
9/14/79	13125 13217	Filled tank with 3.0 gals. of Indolene Clear- Accumulated 192 miles	With old sensor that was used with unleaded fuel- Drive #9 - B. Lowry
9/14/79	13217 13314	Accumulated 197 miles	Drive #10 - unleaded fuel K. Moldenhauer
9/17/79	13314 13345	Filled tank with 9.1 gals. of Indolene Clear- Accumulated 34 miles	

Vehicle History (continued)

VEHICLE #10: 1977 Volvo w/TWC - License 607 WKI

Date	Odometer	Activity	Remarks
9/19/79	13345 13352	Preconditioning	
9/20/79	13352 13363	CVS-75 - 8	8th CVS - Unleaded fuel (Aborted data)
9/20/79	13366 13390	TS-5	(Aborted data)
9/24/79	13390 13397	Preconditioned	
9/25/79	13397 13408	CVS-75 - 9	9th CVS - Unleaded fuel Bypass
9/25/79	13408 13416 13436	Warm-up TS-6	Bypass
9/27/79	13436 13443	Reinstalled original catalyst & preconditioned	
9/28/79	13443 13454	CVS-75 - 10	Final
10/9/79	13454 13488	Returned vehicle to Owner - rented from Systems Control Inc.	

Total Mileage		Total Gallons of Fuel		MPG
Baseline (Pre-poisoning) - 12601-11982=	619	Indolene Clear -	32.0	19.34
Catalyst Poisoning - 13084-12601=	483	Leaded -	26.4	18.30
Baseline (Post-poisoning)- 13488-13084=	404	Indolene Clear -	27.1	14.90
Total	1506	Total	85.5	

Overall fuel economy - 17.61

VEHICLE HISTORY

VEHICLE #21: 1979 Granada - License 091 WSR

Date	Odometer	Activity	Remarks
7/18/79	15,010 15,098	Received at ARB Precheck and precondition	Set to factory specs.
		Baseline Tests (Pre-poisoning tests)	
7/31/79	15,098 15,109	CVS-75-1	Baseline 1-unleaded fuel
8/1/79	15,109 15,120	CVS-75-2	Voided
8/02/79	15,120 15,131	CVS-75-3	Baseline 2-unleaded fuel
		Catalyst Poisoning	
8/03/79	15,131 15,225	Filled tank with 18 gallons of of leaded fuel and accumulated 94 miles	Drive #1-leaded fuel (Driver not recorded)
8/03/79	15,225 15,317	Accumulated 92 miles	Drive #2-leaded fuel Richard Byrd
8/06/79	15,317 15,375	Accumulated 58 miles	Drive #3-leaded fuel Chris Hagman
8/09/79	15,375 15,382	Preconditioned	
8/10/79	15,382 15,393	CVS-75-4	Leaded fuel
		Catalyst Recovery Tests (Post Poisoning)	
8/10/79	15,393 15,640	Filled tank with 20 gallons of Indolene Clear-Accumulated 247 miles.	Drive #4-Indolene clear fuel-Martin Cvjetkovic
	15,640 15,668	Accumulated 28 miles	(Driver and date not recorded)

VEHICLE HISTORY (Continued)

VEHICLE #21: 1979 Granada - License 091 WSR

Date	Odometer	Activity	Remarks
		Catalyst Recovery Tests (Post Poisoning) (continued)	
8/13/79	15,668 15,675	Filled tank with 16 gals. of Indolene Clear-Preconditioned	
8/14/79	15,675 15,686	CVS-75-5	
8/14/79	15,686 15,988	Accumulated 302 miles	Drive #5-Indolene clear fuel-Bill Gertig
8/15/79	15,988	Filled tank with 17 gallons of Indolene clear.	
8/15/79	15,988 15,995	Preconditioning	
8/16/79	15,995 16,007	CVS-75-6	
8/20/79	16,007 16,014	Accumulated 7 miles	Drive #6-city driving C. Uyemura
8/21/79	16,014 16,284	Accumulated 270 miles	Drive #7-(driver unknown)
8/22/79	16,284	Filled tank with 16 gallons of Indolene Clear.	
8/22/79	16,284 16,291	Preconditioning	
8/23/79	16,291 16,303	CVS-72-7	
8/24/79	16,303 16,396	Accumulated 93 miles	Drive #8-Indolene Clear fuel-Richard Byrd
8/24/79	16,396 16,571	Accumulated 175 miles.	Drive #9-Indolene Clear fuel-Fred Baumberger

VEHICLE HISTORY (Continued)

VEHICLE #21: 1979 Granada - License 091 WSR

Date	Odometer	Activity	Remarks
		Catalyst Recovery Tests (Post Poisoning)	(Continued)
8/27/79	16,571	Filled tank with 16.5 gallons of Indolene Clear.	
8/28/79	16,571 16,586	Aborted test (CVS-75-8)	
8/29/79	16,586 16,597	CVS-75-9	
8/31/79	16,597 16,847	Accumulated 250 miles	Drive #10-Indolene clear fuel-Bill Gertig
9/04/79	16,847 16,855	Filled tank with 17 gallons of Indolene Clear-Preconditioned	
9/12/79	16,855 16,866	CVS-75-10	
9/14/79	16,866 16,960	Accumulated 94 miles	Drive #11-Indolene clear fuel-Jack Marshall
9/14/79	16,960 17,056	Accumulated 96 miles	Drive #12-Indolene clear fuel-Dennis Sandoval
9/15/79	17,056	Filled tank with 14.4 gallons of Indolene Clear	
9/17/79	17,056 16,064	Preconditioned	
9/18/79	17,064 17,075	CVS-75-11	
9/20/79	17,075 17,089	Preconditioned	
9/21/79	17,089 17,100	CVS-75-12	Repeat and final

VEHICLE HISTORY (continued)

VEHICLE #21: 1979 Granada - License 091 WRS

Date	Odometer	Activity	Remarks
		Catalyst Recovery tests (Post Poisoning) (Continued)	
9/21/79	17,100 17,148	To and from MVIP inspection station	Passed MVIP released from program
9/21/79	17,148 17,178	Returned vehicle to Hertz at LAX	

Total Miles		
Baseline (Pre-poisoning)	- 15131-15098 =	33
Catalyst poisoning	- 15393-15131 =	262
Baseline Post poisoning)	- 17178-15393 =	1785
TOTAL		2080

Total Gallons of Fuel		MPG
Used tank fuel		-
Leaded	18	14.6
Indolene Clear	116.9	15.3
TOTAL	134.9	
Overall fuel economy		15.4

VEHICLE HISTORY

VEHICLE #22: 1979 Fairmont - License 670 WCH

Date	Odometer	Activity	Remarks
7/18/79	13637 13697	Received at ARB Prechecked & Preconditioned	Set to factory Specs.
		Baseline Tests (Pre-poisoning Tests)	
7/30/79	13697 13703	Preconditioned	
7/31/79	13703 13714	CVS-75-1	Baseline 1 - unleaded fuel
	13714 13725	CVS-75-2	Baseline 2 - unleaded fuel
		Catalyst poisoning	
8/2/79	13725	Filled tank with 16.5 gals of leaded fuel	
8/2/79	13725 13813	Accumulated 88 miles.	Driver #1-on leaded fuel Fred Burriell
8/2/79	13813 13913	Accumulated 100 miles	Driver #2-on leaded fuel Dennis Sandoval
8/2/79	13913 13960	Accumulated 47 miles	Driver #3-on leaded fuel Barbara Lowry
		Catalyst Recovery Test (Post-poisoning)	
8/6/79	13960 13973	Put 7.6 gallons of Indolene Clear in tank. Accumulated 13 miles	Recovery fuel partial tank
8/7/79	13973 13984	CVS-75-3	
8/8/79	13984	Topped off tank with 10.0 gals of Indolene Clear	

VEHICLE HISTORY (Continued)

VEHICLE #22: 1979 Fairmont - License 670 WCH

Date	Odometer	Activity	Remarks
8/8/79	13984 14074	Accumulated 90 miles	Driver #4-Indolene Clear fuel Chris Hagman
8/8/79	14074 14197	Accumulated 123 miles	Driver #5- Indolene Clear fuel Barbara Lowry
8/9/79	14197 14204	Filled tank with 17.7 gals of Indolene clear - Preconditioned	
8/10/79	14204 14215	CVS-75-4	Test voided
8/10/76	14215 14459	Accumulated 244 miles	Driver #6-Indolene clear fuel Frank Cornick
8/13/79	14459 14467	Filled tank with 15.3 gals of Indolene clear - Preconditioned	
8/14/79	14467	CVS-75-5	CO data questionable due to choke malfunction
8/16/79	14486 14497	CVS-75-6 (repeat)	Used for cross check data
8/17/79	14497 14695	Accumulated 198 miles	Drive #7-3rd tank of Indolene clear Martin Cvjetkovic
8/20/79	14695 14702	Filled tank with 15.9 gals of Indolene clear - Preconditioned	
8/21/79	14702 14713	CVS-75-7	
8/22/79	14713 14844	Accumulated 131 miles	Driver #8-Indolene clear fuel clear - Troy Jemetz
8/23/79	14844 14926	Accumulated 82 miles	Driver #9-Indolene clear fuel Dennis Sandoval
8/23/79	14926 14934	Filled tank with 16.0 gals of Indolene clear - Accumulated 8 miles	

VEHICLE HISTORY (continued)

VEHICLE #22: 1979 Fairmont - License 670 WCH

Date	Odometer	Activity	Remarks
8/24/79	14934 14945	CVS-75-8	
8/27/79	14945 15172	Topped tank with 1.8 gals. Accumulated 227 miles	Drive #10-Indolene Clear fuel Bill Gertig
8/28/79	15172 15179	Filled tank with 16.0 gals. of Indolene Clear-preconditioned	
8/29/79	15179 15190	CVS-75-9	
8/30/79	15190 15198	Preconditioned	
8/31/79	15198 15209	CVS-75-10	Repeat
9/11/79	15209 15216	Preconditioned	
9/12/79	15216 15227	CVS-75-11	Repeat
9/13/79	15227 15320	Accumulated 93 miles	Driver #11-Indolene Clear fuel Harold Jackson
9/14/79	15320 15415	Put 5.0 gals in tank Accumulated 95 miles	Driver #12-Indolene Clear fuel Eric Yates
9/17/79	15415 15421	Filled tank with 12.4 gals. of Indolene Clear-Preconditioned	
9/18/79	15421 15432	CVS-75-12	Aborted
9/19/79	15432 15440 15447	Accumulated 8 miles Preconditioned	

VEHICLE HISTORY (continued)

VEHICLE #22: 1979 Fairmont - License 670 WCH

Date	Odometer	Activity	Remarks
9/20/79	15447 15458	CVS-75-13	Repeat
9/21/79	15458 15490	Vehicle returned to Hertz at LAX	

Total Miles

Baseline (Pre-poisoning) - 13725-13637=88
Catalyst poisoning - 13960-13725=235
Catalyst Recovering (Post-poisoning) - 15490-13960=1980
Total 2303

Total Gallons of Fuel		MPG
Tank fuel		-
Leaded	- 16.5	14.24
Indolene Clear	-117.7	16.82
Total	134.5	
overall fuel economy		17.12

VEHICLE HISTORY

VEHICLE #23: 1979 Caprice - License 732 WOD

Date	Odometer	Activity	Remarks
7/17/79	18454 18553	Received at ARB, pre-checked and preconditioned	Prechecked - Set to factory specs.
		Baseline Tests (Pre-poisoning tests)	
7/30/79	18553 18560	Preconditioned	
7/31/79	18560 18571	CVS-75 - 1	Baseline 1 - unleaded fuel
8/01/79	18571 18582	CVS-75 - 2	Baseline 2 - unleaded fuel
		Catalyst Poisoning	
8/2/79	18582 18686	Filled tank with 21.0 gallons of leaded fuel-Accumulated 104 miles	Drive #1 leaded fuel C. Uyemura
8/3/79	18686 18782	Accumulated 96 miles	Drive #2 leaded fuel H. Jackson
8/6/79	18782 18837	Accumulated 55 miles	Drive #3 leaded fuel G. Karras
8/6/79	18837 18845	Preconditioned	
8/7/78	18845 18856	CVS-75 - 3	

VEHICLE HISTORY (continued)

VEHICLE #23: 1979 Caprice - License 782 WOD

Date	Odometer	Activity	Remarks
		Catalyst Recovery (Post-poisoning)	
8/8/79	18856 19116	Filled tank with 21.9 gals of Indolene Clear-Accumulated 260 miles	Drive #4 Indolene Clear fuel B. Gertig
8/8/79	19116 19138	Accumulated 22 miles	Drive #4 continued B. Gertig
8/9/79	19138 19146	Filled tank with 20.7 gals of Indolene Clear-Preconditioned	
8/10/79	19146 19157	CVS-75 - 4 Topped tank with 2.1 gals	
8/10/79	19157 19425	Accumulated 268 miles	Drive #5 - Indolene Clear fuel Dennis Sandoval
8/13/79	19425	Filled tank with 17.5 gals of Indolene Clear	
8/13/79	19425 19433	Preconditioned	
8/14/79	19433 19450	CVS-75 - 5 (Voided) preconditioned	
8/16/79	19450 19461	CVS-75 - 6	Repeat
8/20/79	19461 19553	Accumulated 92 miles	Drive #6 - Indolene Clear Dennis Sandoval
8/21/79	19553 19628	Accumulated 75 miles	Drive #7 - Indolene Clear fuel Paul Newmark

VEHICLE HISTORY (continued)

VEHICLE #23: 1979 Caprice - License 782 WOD

Date	Odometer	Activity	Remarks
8/21/79	19628 19669	Accumulated 41 miles	Drive #8 - Indolene Clear fuel Eric Yates
8/21/79	19669 19677	Filled tank with 19.4 gallons of Indolene Clear-Preconditioned	
8/22/79	19677 19688	CVS-75 - 7	
8/23/79	19688 19885	Accumulated 197 miles	Drive #9 - Indolene Clear fuel M. Fleming
8/24/79	19885 19950	Accumulated 65 miles	Drive #10 - Indolene Clear fuel John O'Cain
8/24/79	19950 19957	Filled with 18 gallons of Indolene Clear-Preconditioned	
8/28/79	19957 19968	CVS-75 - 8	
8/28/79	19968 20140	Accumulated 172 miles	Drive #11 - Indolene Clear fuel Al Donnelly
8/30/79	20140 20187	Accumulated 47 miles	Drive #12 - Indolene Clear fuel John Cansler
8/30/79	20187 20195	Filled tank with 16 gallons of Indolene Clear-Preconditioned	

VEHICLE HISTORY (continued)

VEHICLE #23: 1979 Caprice - License 782 WOD

Date	Odometer	Activity	Remarks
8/31/79	20195 20206	CVS-75 - 9	
9/20/79	20206 20236	Vehicle returned to Hertz at LAX	

Total Miles	
Baseline (Pre-poisoning tests)	18582-18454= 128
Catalyst poisoning	18856-18582= 274
Baseline (Post-poisoning tests)	20236-18856=1380
Total	=1782

Total Gallons of Fuel		MPG
Tank fuel		-
Leaded	- 21.0	13.04
Indolene Clear	- 115.6	11.93
Total	136.6	
Overall fuel economy		13.05

VEHICLE HISTORY

VEHICLE #24: 1979 Cordoba - License 238 XEA

Date	Odometer	Activity	Remarks
7/17/79	10,336 10,404	Received at ARB Prechecked and Preconditioned	Set to factory specs
		Baseline (Pre-poisoning Tests)	
7/30/79	10,404 10,411	Preconditioned	
7/31/79	10,411 10,422	CVS-75-1	Baseline 1-unleaded fuel
8/01/79	10,422 10,433	CVS-75-2	Baseline 2-unleaded fuel
		Catalyst Poisoning	
8/02/79	10,433 10,480	Drained tank, filled with 23 gals. leaded fuel, drove 47 miles	Drive #1-leaded fuel Frank Cornick
8/03/79	10,480 10,571	Accumulated 92 miles	Drive #2-leaded fuel Jack Marshall
8/03/79	10,571 10,667	Accumulated 146 miles	Drive #3-leaded fuel Dennis Sandoval
8/03/79	10,667 10,756	Accumulated 89 miles	Drive #4-leaded fuel Barbara Lowry
8/03/79	10,756 10,801	Accumulated 45 miles	Drive #5-leaded fuel Dennis Sandoval
8/06/79	10,801 10,809	Preconditioned	
8/07/79	10,809 10,820	CVS-75-3	leaded fuel

VEHICLE HISTORY (Continued)

VEHICLE #24: 1979 Cordoba - License 238 XEA

Date	Odometer	Activity	Remarks
		Catalyst Recovery Tests (Post-Poisoning)	
8/08/79	10,820 10,918	Filled tank with 23.7 gallons of Indolene Clear-drove 98 miles	Drive #6-Indolene Clear fuel-Dennis Sandoval
8/08/79	10,918 11,005	Accumulated 87 miles	Drive #7-Indolene Clear fuel-Frank Cornick
8/09/79	11,005 11,097	Accumulated 92 miles	Drive #8-Indolene Clear fuel-Richard Byrd
8/09/79	11,097 11,156	Accumulated 60 miles	Drive #9-Indolene Clear fuel-Paul Newmark
8/10/79	11,156 11,163	Filled tank with 21 gals. of Indolene Clear-preconditioned	
8/14/79	11,163 11,174	CVS-75-4	
8/14/79	11,174 11,252	Accumulated 78 miles	Drive #10-Indolene Clear fuel-Paul Newmark
8/15/79	11,252 11,344	Accumulated 92 miles	Drive #11-Indolene Clear fuel-Richard Byrd
8/15/79	11,344 11,486	Accumulated 142 miles	Drive #12-Indolene Clear fuel-Troy Jemetz
8/16/79	11,520 11,527	Filled tank with 22.2 gals of Indolene Clear-preconditioned	
8/17/79	11,527 11,538	CVS-75-5	
8/20/79	11,538 11,544	Preconditioned	
8/21/79	11,544 11,555	CVS-75-6	Repeat

VEHICLE HISTORY (Continued)

VEHICLE #24: 1979 Cordoba - License 238 XEA

Date	Odometer	Activity	Remarks
		Catalyst Recovery Tests (Post-Poisoning)	(Continued)
8/21/79	11,555 11,942	Topped tank with 3.5 gals of Indolene Clear-Accumulated 387 miles	Drive #13-Indolene Clear fuel-Bill Gertig
8/27/79	11,942 11,950	Filled tank with 22.7 gals of Indolene Clear-Preconditioned	
8/28/79	11,950 11,961	CVS-75-7	
8/29/79	11,961 12,060	Topped off tank (3.0 gals) and accumulated 99 miles	Drive #14-Indolene Clear fuel-Fred Burriell
8/29/79	12,060 12,360	Accumulated 300 miles Filled tank with 22.0 gals of Indolene Clear	Drive #15-Indolene Clear fuel-Bill Gertig
8/30/79	12,360 12,368	Preconditioned	
8/31/79	12,368 12,379	CVS-75-8	
9/11/79	12,379 12,388	Precondition	
9/12/79	12,388 12,399	CVS-75-9	Repeat
9/13/79	12,399 12,495	Accumulated 96 miles	Drive #16-Indolene Clear fuel-Moldenhouer
9/14/79	12,495 12,586	Accumulated 91 miles	Drive #17-Indolene clear fuel-M. Cvjetkovic
9/17/79	12,586 12,679	Accumulated 93 miles	Drive #18-Indolene Clear fuel-Richard Byrd
9/17/79	12,679 12,689	Filled tank with 20 gals. Indolene Clear-Preconditioned	

VEHICLE HISTORY (Continued)

VEHICLE #24: 1979 Cordoba - License 238 XEA

Date	Odometer	Activity	Remarks
		Catalyst Recovery Tests (Post-Poisoning) (Continued)	
9/18/79	12,689	CVS-75-10	
9/21/79	12,703 12,813	Topped tank with 4.6 gals of Indolene Clear-accumulated 110 miles	Drive #19-Indolene Clear fuel-Trejo
9/21/79	12,813 12,908	Accumulated 95 miles	Drive #20-Indolene Clear fuel-Moldenhauer
9/24/79	12,908 12,985	Accumulated 77 miles. Added 3.0 gals Indolene Clear	Drive #21-Indolene Clear fuel-E. Trejo
9/24/79	12,985 13,049	Accumulated 64 miles. Filled tank with 21.5 gals of Indolene Clear	Drive #22-Indolene Clear fuel-D. Sandoval
9/24/79	13,049 13,060	Preconditioned	
9/25/79	13,060 13,071	CVS-75-11	
9/25/79	13,071 13,121	Accumulated 50 miles	Drive #23-Indolene Clear fuel-E. Trejo
9/25/79	13,121 13,258	Accumulated 137 miles	Drive #24-Indolene Clear fuel-E. Huntley
9/26/79	13,258 13,361	Accumulated 103 miles	Drive #25-Indolene Clear fuel-E. Trejo
9/26/79	13,361 13,368	Filled tank with 19.8 gals of Indolene Clear-Preconditioned	
9/27/79	13,368 13,379	CVS-75-12	Final Test
9/27/79	13,479 13,410	Returned to Budget Rent-A-Car at LAX	

VEHICLE HISTORY (Continued)

VEHICLE #24: 1979 Cordoba - License 238 XEA

Total Miles			Total Gallons of Fuel		MPG
Baseline (Pre-Poisoning)	- 10433-10336 =	97	Tank fuel		-
Catalyst Poisoning	- 10820-10433 =	387	Leaded	23.0	16.82
Catalyst Recovery (Post-poisoning)	- 13410-10820 =	2590	Indolene Cl.	184	14.08
	Total	3074	Total	207	
		Overall fuel economy			14.85

VEHICLE HISTORY

VEHICLE #25: 1979 Malibu - License 604 WOF

Date	Odometer	Activity	Remarks
7/27/79	13940 14034	Received at ARB Prechecked and preconditioned	Set to factory specs.
		Baseline Tests (pre-poisoning)	
8/2/79	14034 14041	Preconditioned	
8/3/79	14041 14052	CVS-75-1	Baseline 1 - unleaded fuel
8/6/79	14052 14059	Preconditioned	
8/7/79	14059 14070	CVS-75-2	Baseline 2 - unleaded fuel
		Catalyst Poisoning	
8/9/79	14070	Filled tank with 19.0 gallons of leaded fuel -	
8/10/79	14070 14322	Accumulated 252 miles	Drive # 1 - leaded fuel Bill Gertig
	14322 14356	Accumulated 34 miles	Driver and date not recorded
8/14/79	14356 14367	CVS-75-3	1st test after one tank of leaded fuel
		Catalyst Recovery Tests (post-poisoning)	
8/14/79	14367 14556	Filled tank with 18.1 gals of Indolene Clear - Accumulated 179 miles	Drive #2 - Indolene Clear fuel Troy Jemetz
8/15/79	14556 14606	Accumulated 50 miles	Drive #3 - Indolene Clear fuel Dennis Sandoval
8/15/79	14606 14613	Filled tank with 15 gals of Indolene Clear - Preconditioned	
8/16/79	14613 14624	CVS-75-4	

VEHICLE HISTORY

VEHICLE #25: 1979 Malibu - License 604 WOF

Date	Odometer	Activity	Remarks
8/17/79	14624 14928	Accumulated 304 miles	Drive #4 - Indolene Clear fuel Bill Gertig
8/20/79	14928 14936	Filled tank with 16 gallons of Indolene Clear - Preconditioned	
8/21/79	14936 14947	CVS-75-5	
8/22/79	14947 15053	Accumulated 106 miles	Drive #5 - Indolene Clear fuel C. Uyemura
8/23/79	15053 15172	Accumulated 119 miles	Drive #6 - Indolene Clear fuel Eric Yates
8/24/79	15172 15179	Filled tank with 15.6 gallons at Indolene Clear - Preconditioned	
8/24/79	15179 15190	CVS-75-6	
8/27/79	15190 15296	Accumulated 106 miles	Drive #7 - Indolene Clear fuel Barbara Lowry
8/28/79	15296 15388	Accumulated 92 miles	Drive #8 - Indolene Clear fuel Richard Byrd
8/28/79	15388	Filled tank with 12 gallons of Indolene Clear	
8/28/79	15388 15426	Accumulated 38 miles	Drive #9 - Indolene Clear fuel Eric Yates
8/28/79	15426 15433	Preconditioning	
8/29/79	15433 15444	CVS-75-7	
8/29/79	15444 15543	Accumulated 99 miles	Drive #10 - Indolene Clear fuel C. Uyemura

VEHICLE HISTORY

VEHICLE #25: 1979 Malibu - License 604 WOF

Date	Odometer	Activity	Remarks
8/30/79	15543 15611	Accumulated 68 miles	Drive #11 - Indolene Clear fuel Neal Ehlinger
8/30/79	15611 15620	Filled tank with 15 gallons of Indolene Clear - preconditioned	
8/31/79	15620 15631	CVS-75-8	
9/20/79	15631 15666	Vehicle returned to Hertz at LAX	

Total Miles

Baseline (Pre-poisoning) 14070 - 13940 = 130
Catalyst poisoning 14367 - 14070 = 297
Catalyst recovery (post-poisoning) 15666 - 14367 = 1299
Total = 1726

Total Gallons of Fuel		MPG
Tank fuel		-
Leaded -	19.0	15.63
Indolene Clear -	91.7	17.40
Total	110.7	
Overall fuel economy		15.59